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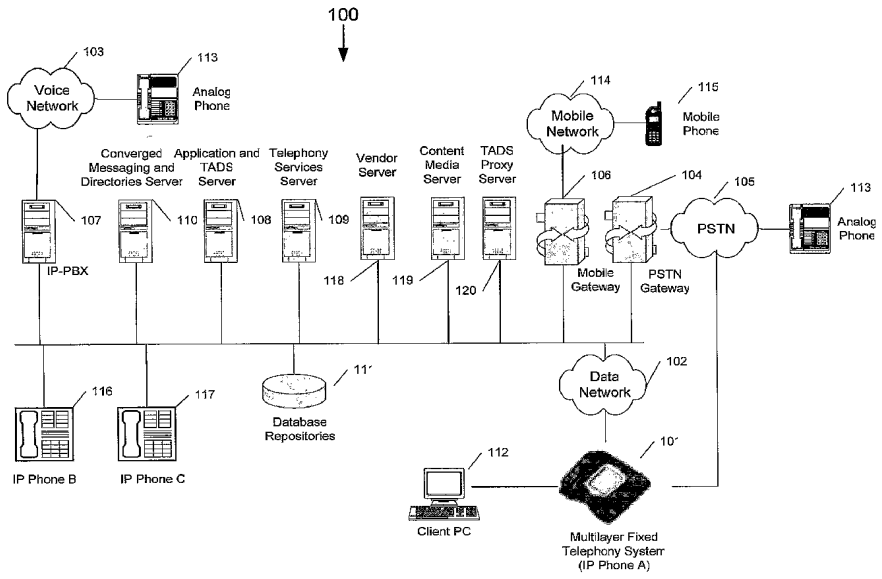
(54) Title: SOFTWARE PLATFORM FOR DATA-VOICE APPLICATIONS OPERATING ON AN INTERNET PROTOCOL (IP) PHONE



(57) Abstract: A software platform in an Internet Protocol (IP) phone having the ability to be used with different communication infrastructures such as broadband, wireless communication and Plain Old Telephone System (POTS) service. Further, the software platform in the IP phone is used in conjunction with a communication architecture, referred to herein as the Transaction Applications Delivery Services (TADS) communications architecture, that provides the ability to develop, deliver and manage data-voice applications operating on the IP phone.

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SOFTWARE PLATFORM FOR DATA-VOICE APPLICATIONS OPERATING ON AN INTERNET PROTOCOL (IP) PHONE

TECHNICAL FIELD

The present invention relates to the field of an internet phone system, and more particularly to a software platform for developing, delivering and managing data-voice applications operating on an Internet Protocol ("IP") phone.

BACKGROUND OF INVENTION

Recently, multimedia communication in which voice, video and data information are transmitted and received using the Internet Protocol (IP) is carried over an IP network. A phone, referred to herein as an "IP phone" or more generally as a "converged communications terminal", may be connected directly to the IP network over which a multimedia phone exchange system can be constructed. An IP phone is a telephone which can operate and execute voice communication in the same way as conventional telephones either via a Plain Old Telephone System (POTS) or an IP network. Further, the IP phone can use the IP network for data applications. For example, IP phones may be connected to an IP network, such as a local area network, in an office environment thereby using the network as a private telephone network circuit and as a data exchange network. In another example, IP phones may use a wide area network, e.g., Internet, to communicate with other properly configured IP phones for data-voice exchanges. In another example, IP phones may use a data network for transactional data applications and the POTS network for voice.

IP phones currently have features similar to those found in traditional public switched telephone network (PSTN) phones such as call forwarding, call waiting, conference calls and so forth. Enhancements to these feature sets have been slow in coming, as market leaders in the "Voice over IP" (VoIP) telephony field have pursued an incremental approach to their product offerings, particularly because of the lack of computing power available in VoIP platforms. Currently, to ensure optimal user experience and cost-performance, VoIP platforms may have to be specifically designed for a target market area and software application (e.g., data-voice application) operating on the IP phone. By having to design and implement separate VoIP platforms for each application operating on the IP phone, the cost in operating different applications on an IP phone may be prohibitive.

Furthermore, service providers (referring to the providers that provide communications service for the IP phone to operate) and content providers (referring to the providers of data-voice applications that operate on the IP phone) do not currently have the ability to successfully develop, deploy, monitor, debug and upgrade data-voice applications that operate on an IP phone.

Therefore, there is a need in the art for an IP phone configured with a VoIP platform that can support different applications operating on the IP phone. Further, there is a need in the art for an ability to develop, deliver and manage data-voice applications operating on an IP phone.

SUMMARY OF INVENTION

The problems outlined above may at least in part be solved in some embodiments by a software platform in an IP phone having the ability to be used with different communication infrastructures such as broadband, wireless communication, POTS service. Further, the software platform is used in conjunction with a communications architecture, referred to herein as the Transaction Applications Delivery Services (TADS) communications architecture, that provides the ability to develop, deliver and manage data-voice applications operating on the IP phone

In one embodiment of the present invention, a method for identifying phone numbers made by a user of an Internet Protocol (IP) phone that did not contact intended recipients may comprise the step of sending an error message to the IP phone by a server indicating a dialed phone number made by the user of the IP phone failed to connect. The method may further comprise receiving an alarm message from the IP phone indicating a phone number that did not contact an intended recipient. The method may further comprise incrementing a failure count for the phone number that did not contact the intended recipient. The method may further comprise flagging the phone number that did not contact the intended recipient if the failure count exceeds a threshold.

In another embodiment of the present invention, a method for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone may comprise the step of sending an error message to the IP phone by a server indicating a directory search performed by the user of the IP phone failed to identify the contact with a phone number. The method may further comprise receiving an alarm message from the IP phone indicating an improper graphic. The method may further comprise incrementing a failure count for the searched contact. The method may further comprise flagging the directory search if the failure count exceeds a threshold.

In another embodiment of the present invention, a computer program product embodied in a machine readable medium for identifying phone numbers made by a user of an Internet Protocol (IP) phone that did not contact intended recipients may comprise the programming step of sending an error message to the IP phone by a server indicating a dialed phone number made by the user of the IP phone failed to connect. The computer program product may further comprise the programming step of receiving an alarm message from the IP phone indicating a phone number that did not contact an intended recipient. The computer program product may further comprise the programming step of incrementing a failure count for the phone number that did not contact the intended recipient. The computer program product may further comprise the programming step of flagging the phone number that did not contact the intended recipient if the failure count exceeds a threshold.

In another embodiment of the present invention, a computer program product embodied in a machine readable medium for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone may comprise the programming step of sending an error message to the IP phone by a server indicating a directory search performed by the user of the IP phone failed to identify the contact with a phone number. The computer program product may further comprise the programming step of receiving an alarm message from the IP phone indicating an improper graphic. The computer program product may further comprise the programming step of incrementing a failure count for the searched contact. The computer program product may further comprise the programming step of flagging the directory search if the failure count exceeds a threshold.

In another embodiment of the present invention, a system may comprise a memory unit operable for storing a computer program operable for identifying phone numbers made by a user of an Internet Protocol (IP) phone that did not contact intended recipients. The system may further comprise a processor coupled to the memory unit, where the processor, responsive to the computer program, comprises circuitry for sending an error message to the IP phone by a server indicating a dialed phone number made by the user of the IP phone failed to connect. The processor may further comprise circuitry for receiving an alarm message from the IP phone indicating a phone number that did not contact an intended recipient. The processor may further comprise circuitry for incrementing a failure count for the phone number that did not contact the intended recipient. The processor may further comprise circuitry for flagging the phone number that did not contact the intended recipient if the failure count exceeds a threshold.

In another embodiment of the present invention, a system may comprise a memory unit operable for storing a computer program operable for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone. The system may further comprise a processor coupled to the memory unit, where the processor, responsive to the computer program, comprises circuitry for sending an error message to the IP phone by a server indicating a directory search performed by the user of the IP phone failed to identify the contact with a phone number. The processor may further comprise circuitry for receiving an alarm message from the IP phone indicating an improper graphic. The processor may further comprise circuitry for incrementing a failure count for the searched contact. The processor may further comprise circuitry for flagging the directory search if the failure count exceeds a threshold.

In another embodiment of the present invention, a method may comprise the step of receiving a first wakeup call to an Internet Protocol (IP) phone from a server. The method may further comprise receiving one or more of reminders, alerts, newspaper material and a list of information categories from the server if the first wakeup call is confirmed by a user of the IP phone. The method may further comprise receiving a second wakeup call after a particular time period specified in the user's profile if the first wakeup call is not confirmed by the user of the IP phone.

In another embodiment of the present invention, a method for contacting a merchant of an advertisement displayed on an Internet Protocol (IP) phone may comprise the step of receiving an advertisement on a webpage displayed on the IP phone, where the advertisement on the webpage includes session initiation protocol (SIP) based uniform resource identifiers (URIs). The method may further comprise selecting the advertisement. The method may further comprise passing a URI associated with the selected advertisement by a web browser of the IP phone to an application of the IP phone. The method may further comprise generating a call to a merchant associated with the selected advertisement based on the URI associated with the selected advertisement by the application of the IP phone.

In another embodiment of the present invention, a method for generating a conference call from an Internet Protocol (IP) phone may comprise the step of creating a conference call meeting profile containing contact information for all conference participants in response to scheduling a meeting. The method may further comprise sending the conference call meeting profile to a first phone application of the IP phone, where the first phone application is configured to maintain a calendar of a first user of the IP phone. The method may further comprise executing the conference call meeting profile. The method may further comprise instructing the IP phone to generate a conference call to the conference participants identified in the profile.

In another embodiment of the present invention, a method for establishing a conference call with an Internet Protocol (IP) phone may comprise the step of storing a conference call meeting profile containing contact information for all conference participants, where the conference call meeting profile comprises a set of instructions which are to be followed upon activation of the conference call meeting profile. The method may further comprise receiving an indication to start a conference call associated with the conference call meeting profile. The method may further comprise activating the conference call meeting profile. The method may further comprise inviting each of the conference participants to establish communication with the IP phone.

In another embodiment of the present invention, a method for controlling content distribution to and from an Internet Protocol (IP) phone may comprise the step of storing profile preferences of a profile in a database, where the profile preferences of the profile comprises rules as to which telephone calls and content are allowed to be received by a user of the IP phone and which telephone calls and content are forbidden to be received by the user of the IP phone. The method may further comprise associating the profile with a schedule, where the schedule enables different telephone calls and content to be received and forbidden at different times during the day. The method may further comprise receiving a request to send content to the user of the IP phone. The method may further comprise determining if the user of the IP phone is allowed to receive the content based on the profile preferences of the profile.

In another embodiment of the present invention, a method for controlling content distribution to and from an Internet Protocol (IP) phone may comprise the step of storing profile preferences of a profile in a database, where the profile preferences of the profile comprises rules as to which telephone calls and content are allowed to be received by a first user of an IP phone and which telephone calls and content are forbidden to be received by the first user of the IP phone. The method may further comprise associating the profile with a schedule, where the schedule enables different telephone calls and content to be received and forbidden at different times during the day. The method may further comprise receiving a request by a second user to telephonically connect to the first user of the IP phone. The method may further comprise determining if the first user of the IP phone is allowed to telephonically connect to the second user based on the profile preferences of the profile.

In another embodiment of the present invention, a method for a user to access content on an Internet Protocol (IP) phone from a hotel may comprise the step of generating a content package to be displayed on the IP phone, where the content packages comprise customized content, where the content package comprises one or more of the following: check-in/check-out assistance and information, billing information, room service orders, and concierge services information. The method may further comprise transmitting the content package to the IP phone. The method may further comprise providing a user of the IP phone with controls to access content of the generated content package.

In another embodiment of the present invention, a method for facilitating the management of directory updates may comprise the step of generating a validation code in response to a vendor performing one or more of updating, correcting and setting up a contact information associated with a phone line of interest. The method may further comprise sending the validation code along with a telephone number to call to an e-mail address of the vendor. The method may further comprise generating one or more of an electronic mail and a facsimile. The method may further comprise sending the one or more of the electronic mail and the facsimile to the vendor indicating that the phone line contact information has been successfully updated.

In another embodiment of the present invention, a method for assigning content to Internet Protocol (IP) phones may comprise the step of storing content created by an administrator on a database repository. The method may further comprise assigning profiles to phone groups. The method may further comprise reading content identifications from the database repository and assigning the read content identifications to the phone groups. The method may further comprise returning content corresponding to a requested identification.

The foregoing has outlined rather generally the features and technical advantages of one or more embodiments of the present invention in order that the detailed description of the present invention that follows may be better understood. Additional features and advantages of the present invention will be described hereinafter which may form the subject of the claims of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the present invention can be obtained when the following detailed description is considered in conjunction with the following drawings, in which:

Figure 1 illustrates an embodiment of the present invention of a system implementing a multi-layer fixed telephone system interacting with different communication infrastructures;

Figure 2 illustrates a typical hardware configuration of an application and TADS server in accordance with an embodiment of the present invention;

Figure 3 illustrates an embodiment of the present invention of an external configuration of an IP phone;

Figure 4 illustrates a typical hardware configuration of the IP phone in accordance with an embodiment of the present invention;

Figure 5 illustrates the software platform of the IP phone in accordance with an embodiment of the present invention;

Figure 6 illustrates an embodiment of the present invention of the communication infrastructure services layer of the software platform of the IP phone;

Figure 7 illustrates an embodiment of the present invention of the common converged communication base services layer of the software platform of the IP phone;

Figure 8 illustrates the relationship between open-standard protocols and the TADS protocol family and services in accordance with an embodiment of the present invention;

Figure 9 illustrates an embodiment of the present invention of the domain-specific application layer of the software platform of the IP phone;

Figure 10 illustrates an embodiment of the present invention of an application hosting services ("AHS") architecture using the software platform in the IP phone;

Figure 11 illustrates an embodiment of the present invention of a client-server Transactional Applications Delivery System (TADS) communications architecture;

Figure 12 illustrates an embodiment of the present invention of a transactional application delivery system server side elements;

Figure 13 illustrates an embodiment of the present invention of a transactional application delivery system client side elements;

Figure 14 illustrates an embodiment of the present invention of the server side of a transactional application delivery system;

Figure 15 illustrates an embodiment of the present invention of the client side of a transactional application delivery system;

Figure 16 is a flowchart of a method for creating and storing personal preferences or profiles via a configuration portal to a wakeup server in accordance with an embodiment of the present invention;

Figure 17 is a high-level state machine diagram of the wakeup service in accordance with an embodiment of the present invention;

Figure 18 shows the sequence of events associated with the IP phone automatically answering a wakeup call in accordance with an embodiment of the present invention;

Figure 19 shows the sequence of events associated with a user answering a wakeup call in accordance with an embodiment of the present invention;

Figure 20 shows how the wakeup service can remind the user of a special date in a calendar in accordance with an embodiment of the present invention;

Figure 21 shows how the wakeup service can alert the user of special entertainment events in accordance with an embodiment of the present invention;

Figure 22 shows how the wakeup service can send the user urgent unread e-mails or voicemails that arrived during the night and that may require immediate attention during the morning in accordance with an embodiment of the present invention;

Figure 23 shows how the wakeup service can send the user the information that might be of interest while waking up in accordance with an embodiment of the present invention;

Figure 24 shows the sequence of events associated with the selectable failure threshold for the manual solution for enhanced data integrity methods in accordance with an embodiment of the present invention;

Figure 25 shows the sequence of events associated with the selectable failure threshold for the automatic solution for enhanced data integrity methods in accordance with an embodiment of the present invention;

Figure 26 shows the detailed sequence of events associated with the selectable failure threshold applicable to both the manual and automatic methods in accordance with an embodiment of the present invention;

Figure 27 is a flowchart of a method for facilitating the management of directory updates via vendor self-fulfillment in accordance with an embodiment of the present invention;

Figure 28 shows the sequence of events associated with the "click to dial" enhanced merchant-customer interaction method in accordance with an embodiment of the present invention;

Figure 29 shows the sequence of events associated with the "more information" enhanced merchant-customer interaction method in accordance with an embodiment of the present invention;

Figure 30 shows the sequence of events associated with the auto-conference call phone synchronization solution in accordance with an embodiment of the present invention;

Figure 31 shows the sequence of events associated with the auto-conference call phone subscription solution in accordance with an embodiment of the present invention;

Figure 32 shows the sequence of events associated with the auto-conference call phone subscription solution in accordance with an embodiment of the present invention;

Figure 33 shows the sequence of events associated with the usage control method in connection with content distribution scenarios in accordance with an embodiment of the present invention;

Figure 34 shows the sequence of events associated with the usage control method in connection with call control scenarios in accordance with an embodiment of the present invention;

Figure 35 shows the sequence of events associated with a method to facilitate the control and distribution of content to hospitality phones in accordance with an embodiment of the present invention;

Figure 36 shows the sequence of events associated with assigning content to phones in accordance with an embodiment of the present invention;

Figure 37 shows the sequence of events associated with updating existing content in accordance with an embodiment of the present invention;

Figure 38 shows the sequence of events associated with handling local content requests in accordance with an embodiment of the present invention;

Figure 39 shows the sequence of events associated with handling external content requests in accordance with an embodiment of the present invention;

Figure 40 shows the sequence of events associated with handling PMS interaction in a hospitality setting in accordance with an embodiment of the present invention;

Figure 41 shows another sequence of events associated with handling PMS interaction in a hospitality setting in accordance with an embodiment of the present invention when it is the PMS that initiates a request for the update of PMS information on a phone;

Figure 42 shows the message exchange between a TADS server and an IP Phone during a software deployment and update operation in accordance with an embodiment of the present invention; and

Figure 43 shows the message exchange between a TADS server and an IP Phone during a software configuration operation in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Although the present invention is described with reference to an Internet Protocol (IP) phone it is noted that the principles of the present invention may be applied to any Internet connected device, such as an Internet appliance. It is further noted that embodiments applying the principles of the present invention to such Internet connected devices would fall within the scope of the present invention.

In the following description, numerous specific details are set forth to provide a thorough understanding of the present invention. However, it will be apparent to those skilled in the art that the present invention may be practiced without such specific details. In other instances, well-known circuits and software modules have been shown in block diagram form in order not to obscure the present invention in unnecessary detail. For the most part, details considering timing considerations and the like have been omitted inasmuch as such details are not necessary to obtain a complete understanding of the present invention and are within the skills of persons of ordinary skill in the relevant art.

Figure 1 illustrates a high level diagram of an embodiment of the present invention of a system **100** implementing a multi-layer fixed telephone system **101** interacting with different communication infrastructures. Referring to Figure 1, system **100** allows multi-layer fixed telephone system **101** (referred to herein as a "IP phone A" or more generally as "IP Phone") to interact with other entities over different communication infrastructures,

such as data, voice, mobile and Public Switched Telephone Networks (PSTN) **102**, **103**, **114**, **105**, respectively, to provide telephony functions and run applications. A more detailed description of the external configuration of IP phone **101** is described below in association with Figure 3. Further, a more detailed description of the hardware configuration of IP phone 101 is described further below in association with Figure 4. In one embodiment, IP phone 101 may be coupled to a computer system **112**, data network **102** and a Public Switched Telephone Network (PSTN) **105**. IP phone **101** may communicate with third-party voice over IP (VoIP) terminals **116** and **117** (IP Phones B and C, respectively) via data network **102**. IP phone **101** may further communicate with an analog phone **113** over PSTN **105**. IP phone **101** may further communicate with analog phone **113** over voice network **103** via data network **102**. Further, IP phone **101** may communicate with a mobile phone **115** over mobile network **114** via data network **102**.

System **100** may further include a Public Switched Telephone Network (PSTN) Gateway **104** coupled to data network **102**. PSTN gateway **104** may be configured to translate signaling and media between data network **102** coupled to IP phone **101** and PSTN **105**. PSTN **105** may be coupled to conventional telephone **113**. PSTN gateway **104** may allow IP phone **101** to communicate with standard analog telephones **113** in PSTN **105**.

System **100** may further include a mobile gateway **106** coupled between data network **102** and mobile network **114**. Mobile gateway **106** may be configured to translate signaling and media between data network **102** and mobile wireless network **114**. Mobile network **114** may be coupled to mobile telephone **115**. Mobile gateway **106** may allow IP phone **101** to communicate with mobile phones **115** in wireless network **114**. IP phone **101** may signal mobile gateway **106** in order to enable calls destined to mobile telephone **115** to be terminated on IP phone **101**.

System **100** may further include an Internet Protocol-Private Branch eXchange (IP-PBX) **107** coupled to data network **102**, voice network **103** and analog phones **113** or VoIP phone **116**. IP-PBX **107** may be configured to interconnect voice and data networks **103**, **102**, respectively, in an enterprise environment and provide centralized call control functionality.

System **100** may further include a telephony services server **109** coupled to data network **102**. Telephony services server **109** may be configured to provide services that allow IP phone **101** to communicate with other analog and VoIP terminals and extend its range of available telephony features.

System **100** may further include a converged messaging and directory server **110** coupled to data network **102**. Converged messaging and directory server **110** may be configured to contain all the components necessary to provide the user with a unified converged platform to send and receive electronic and voice mail messages. In addition, server **110** may provide IP phone **101** with access to personal and public contact directories.

System **100** may further include a vendor server **118** coupled to data network **102**. Vendor server **118** may be configured to allow end-users to access and purchase goods and services via IP phone **101**.

System **100** may further include a content and media server **119** coupled to data network **102**. Content media server **119** may be configured to allow end-users access to media content via IP phone **101**.

System **100** may further include a TADS proxy server **120** coupled to data network **102**. TADS Proxy Server **120** can be placed in front of two or more TADS servers to achieve load balancing and redundancy.

System **100** may further include a database repository **111** coupled to data network **102**. Database repository **111** may be configured to manage and provide IP phone **101** and servers **107**, **108**, **109**, **110**, **119** and **120** with data needed to perform their tasks.

System **100** may further include an application server **108** coupled to data network **102**. Application server **108** may be configured to contain the server side components (discussed further below) of client/server applications accessed through IP phone **101**, such as the components of the Transactional Application Delivery System (TADS) (discussed further below).

It is noted that Figure 1 is illustrative and that not all of the components of system **100** were depicted for the sake of brevity (e.g., provisioning and configuration servers). It is further noted that system **100** is not to be limited in scope to the system disclosed.

Figure 2 illustrates a typical hardware configuration of server **108** (Figure 1) which is representative of a hardware environment for practicing the present invention including performing the steps performed by server **108** described below in connection with Figures 18-43. Referring to Figure 2, server **108** may have a processor **210** coupled to various other components by a system bus **212**. An operating system **240**, may run on processor **210** and provide control and coordinate the functions of the various components of Figure 2. An application **250** in accordance with the principles of the present invention may run in conjunction with operating system **240** and provide calls to operating system **240** where the calls implement the various functions or services to be performed by application **250**. Application **250** may include, for example, a program for performing the steps performed by server **108** as described below for various enhanced services described in connection with Figures 18-43.

Read only memory (ROM) **216** may be coupled to system bus **212** and include a basic input/output system ("BIOS") that controls certain basic functions of server **108**. Random access memory (RAM) 214 and disk adapter **218** may also be coupled to system bus **212**. It should be noted that software components including operating system **240** and application **250** may be loaded into RAM **214** which may be server's **108** main memory. Disk adapter **218** may be an integrated drive electronics ("IDE") adapter that communicates with a disk unit **220**, e.g., disk drive. It is noted that the application for performing the steps performed by server **108** as described above in connection with Figures 18-43 may reside in disk unit **220** or in application **250**.

Referring to Figure 2, communications adapter **223** may also be coupled to system bus **212**. Communications adapter **223** may interconnect bus **212** with an outside network **102** enabling server **108** to communicate with IP phone **101**.

Implementations of the present invention include implementations as a computer system programmed to execute the method or methods described herein, and as a computer program product. According to the computer system implementations, sets of instructions for executing the method or methods may be resident in the random access memory **214** of one or more computer systems configured generally as described above. Until required by server **108**, the set of instructions may be stored as a computer program product in another computer memory, for example, in disk drive **220** (which may include a removable memory such as an optical disk or floppy disk for eventual use in disk drive **220**). Furthermore, the computer program product may also be stored at another computer and transmitted when desired to the user's workstation by a network or by an external network such as the Internet. One skilled in the art would appreciate that the physical storage of the sets of instructions physically changes the medium upon which it is stored so that the medium carries computer readable information. The change may be electrical, magnetic, chemical or some other physical change.

Figure 3 illustrates an embodiment of an element of the present invention of an external configuration of IP phone **101**. Referring to Figure 3, IP phone **101** includes a touch screen display **301** with the capability of displaying graphical images and collecting input from the user by pressing certain areas in the screen with a finger

or an instrument designed for such purposes such as a stylus. IP phone **101** may further include a message waiting indicator **302** to alert the user that a new message has arrived to the user's inbox. Below touch screen display **301**, IP phone **101** includes four directional keys **303A-D** (**303A** configured to move an image displayed on screen **101** up; **303B** configured to move an image displayed on screen **101** down; **303C** configured to move an image displayed on screen **101** to the left; and **303D** configured to move an image displayed on screen **101** to the right); and an OK button **304** to navigate the user interface screens **301** and select items in focus, as an alternative to using the touch screen. To each side of directional keys **303A-D**, IP phone **101** includes SEND and END keys **305**, **306**, respectively. Keys **305**, **306** may be used as an alternative to the touch screen to exercise telephony features in graphical user interface **301** such as initiating and finishing a call. In addition, keys **305**, **306** can be used to help the user navigate the user interface; for example, using END button **306** to go directly to the home screen or cancel some operation. IP Phone **101** also includes the following connectors distributed along side **313** for external devices: Universal Serial Bus (USB) **314**, headset **315**, microphone **316**, Ethernet switched port for Personal Computer (PC) and Local Area Network (LAN), **317** and **318**, respectively, power supply **319**, RJ-11 (POTS) connector **320**, antenna **321** for support of wireless protocols such as, but not limited to, wireless fidelity (WI-FI) and Zigbee, RS-232 serial port **322**, and JTAG connector **323**.

IP phone **101** may further include an opening **307** for a phone speaker and a handset cradle **308** for corded or cordless handsets. IP phone **101** may further include a standard telephony keypad array **309** consisting of digits 0 to 9, the star and pound keys. Below keypad **309**, IP phone **101** may include a circular key **310** used to activate and deactivate speakerphone **307**. At each side of speakerphone key **310**, two triangular keys **311A-B** may be used to increase (**311B**) and decrease (**311A**) the volume of the active audio output: handset, headset, speaker or ringer. Below speakerphone and volume keys **310**, **311A-B**, respectively, IP phone **101** includes an indicator **312** that turns on when speakerphone **307** is active and turns off when speakerphone **307** is inactive.

An embodiment of the hardware configuration of IP phone **101** is provided below in association with Figure 4. Referring to Figure 4, IP phone **101** may include a processor **401** coupled to various other components by system bus **413**. An operating system **410** may run on processor **401** and provide control and coordinate the functions of the various components of Figure 4. An application **411** in accordance with the principles of the present invention may run in conjunction with operating system **410** and provide algorithms, domain-specific knowledge and calls to operating system **410** where the algorithms, domain-specific knowledge and calls implement the various functions or services to be performed by application **411**. Application **411** may include, for example, an application configured to perform wake-up call transactions, phone directory searches, information and content retrieval, and enhanced call-control functions. Application **411** may include other applications to perform the steps performed by IP phone **101** as discussed further below.

Read only memory (ROM) **402** may be coupled to system bus **413** and could include a basic input/output system ("BIOS") that controls certain basic functions of IP phone **101**. Persistent memory ("FLASH") **412** may be coupled to system bus **413** and include the operating system **410**, configuration data and user data. It is further noted that one or more applications **411** may reside in FLASH **412**. Random access memory (RAM) **409** and disk adapter **407** may also be coupled to system bus **413**. It should be noted that software components including operating system **410** and application **411** may be loaded into RAM **409** which may be IP phone's **101** main memory. Disk adapter **407** may be an integrated drive electronics ("IDE") adapter that communicates with a disk unit **408**, e.g., disk drive. It is noted that the applications mentioned above may reside in disk unit **408**.

Returning to Figure 4, in conjunction with Figure 1, communications adapter **405** may also be coupled to system bus **413**. Communications adapter **405** may interconnect bus **413** with an outside network **404** enabling IP phone **101** to communicate with data network **102**, servers **107**, **108**, **109**, **110**, **118**, **119**, analog phones **113** via PSTN **105**, mobile phone **115** via mobile network **114**, etc.

Returning to Figure 4, in conjunction with Figure 3, other devices **403** may be integrated into the system bus **413** via miscellaneous input/output (I/O) ports **406**.

Implementations of the invention include embodiments as a VoIP phone (IP phone) programmed to execute the method or methods described herein, and as a computer program product. According to the implementations, sets of instructions for executing the method or methods may be resident in the random access memory **409** of one or more systems configured generally as described above. Until required by IP phone **101**, the set of instructions may be stored as a computer program product in another computer memory, for example, in disk unit **408**. Furthermore, the computer program product may also be stored at another computer and transmitted when desired to the IP phone **101** by a network or by an external network **404** such as the Internet. One skilled in the art would appreciate that the physical storage of the sets of instructions physically changes the medium upon which it is stored so that the medium carries computer readable information. The change may be electrical, magnetic, chemical or some other physical change.

IP phone **101** includes a software platform with multiple layers adaptable to be used with different applications operating on IP phone **101** as well as adaptable to using different communication infrastructures. An embodiment of such a software platform is provided below in association with Figure 5.

Referring to Figure 5, platform **500** of IP phone **101** may include five layers. Layer 1 (hardware platform) **501** of platform **500** may include software to control the physical embodiment of IP phone **101**. The physical embodiment includes, but is not limited to, Application-Specific Integrated Circuits (ASICs), processing elements, Input/Output (I/O) devices, peripherals, and storage elements.

Layer 2 (operating system services) **502** of platform **500** provides an interface to access operating system (OS) services and hardware platform devices. Layer 2 **502** provides an execution environment for the software modules and a hardware abstraction layer. Among the responsibilities of layer 2 **502** include implementing common OS services such as memory management, task management, date and time information, and access to peripherals; providing file system services to emulate hard disk drive on flash memory devices; providing a Transport Control Protocol/Internet Protocol (TCP/IP) networking API and the implementation of other required protocols such as Dynamic Host Configuration Protocol (DHCP), Trivial File Transfer Protocol (TFTP), Simple Network Time Protocol (SNTP) and Simple Network Management Protocol (SNMP); providing an embedded web server implementation that allows remote configuration through a web browser; implementing core graphics functionality for drawing, window management, event routing, fonts and bitmaps; and, implementing hardware drivers for each of the converged communication terminal's **101** peripherals.

Layer 3 (communications infrastructure services) **503** of platform **500** may be configured to interface with multiple communication infrastructures. Layer 3 503 of platform **500** contains a local services pool and a remote services pool, as illustrated in Figure 6. It is important to note that system **100** (Figure 1) contains a basic set of telephony features provided by a Common Converged Communication Base Services (CCCBS) layer **504**, as discussed below, which makes server-less communications straightforward as there is no reliance on the server/proxy for such features.

Figure 6 illustrates an embodiment of the present invention of layer 3 **503**. Referring to Figure 6, in conjunction with Figures 1 and 5, layer 3 **503** may include a remote services pool **601**. Remote services pool **601** refers to components that do not reside locally on IP phone **101**, but rather on telephony services **109** or PSTN **105** with which IP phone **101** may have to collaborate to provide extended communications features and converged voice/data/video services and/or interface with proprietary IP PBXs **107**, application servers **108** and PSTN elements such as centrex, call managers and softswitches. For every specific external collaborating entity, there might be an adapter module that implements all or part of the functionality exposed by a Communication Infrastructure Services (CIS) API **507**, as discussed below.

Layer 3 **503** may further include a local services pool **602**. Local services pool **602** refers to components that reside on IP phone **101** and can provide an interface to communicate and collaborate with proprietary IP PBXs **107**, application servers **108** and PSTN **105** elements such as centrex, call managers and softswitches. While the vendor-specific interface implementation could reside locally or remotely on a network server or switch, the advantage of implementing this component on a network server or switch and leaving locally only a proxy to those services is that the need to create a new converged communications terminal **101** image for each change in an external component may be avoided. In addition, the gateway implementation may not be constrained by the (possibly) limited IP phone **101** resources.

Returning to Figure 5, platform **500** includes a layer 4 (common converged communications base services) **504**. Layer 4 **504** includes communications (telephony) specific services as well as other data services that may be required by domain-specific converged communication applications (referring to applications operating on IP phone **101**), as illustrated in Figure 7.

Figure 7 illustrates an embodiment of the present invention of layer 4 **504**. Referring to Figure 7, layer 4 **504** includes telephony services **701**. Telephony services **701** include call processing functions that implement the core functionality to initiate, terminate and manage phone calls over VoIP and/or POTS communication infrastructures. Layer 4 **504** may further include an implementation of signaling, media transport, voice processing and call control functionality. Among the responsibilities of these functions are: providing basic call control features; providing call setup and tear down functionality through protocols like Session Initiation Protocol (SIP), H.323, Media Gateway Control Protocol (MGCP) and others; providing media transport and signaling through protocols like Real-Time Protocol (RTP) and Real-Time Control Protocol (RTCP); providing voice processing features (echo cancellation, Voice Activity Detection (VAD), jitter buffering, etc); and notifying call-related events to the upper layer.

Layer 4 **504** may further include other services **702**, such as data services. Services **702** may include Hyper-Text Transfer Protocol (HTTP) clients, Remote Procedure Call / Simple Object Access Protocol (RPC/SOAP), eXtensible Markup Language (XML) parser, directory services, configuration, Personal Computer/ Personal Data Assistant (PC/PDA) synchronization, and user interface. HTTP client services provide a transport protocol to store and retrieve from server objects such as XML documents and images and play an important role in IP communications and application development, therefore enabling converged communications terminal **101** to participate in web-centric architectures. RPC/SOAP services, implement an interface to make remote procedure calls. Remote procedure calls allow IP phone **101** to send requests to and receive responses from components in the computer network. SOAP is an implementation of RPC that uses XML to format request/response information and HTTP to transport this information. Providing support for SOAP enables IP phone **101** to

participate in web services. XML parser services translate data represented in XML format into internal data structures and requests for services. Structuring documents using XML allows sharing of information between different platforms and applications. In IP phone **101** there are at least three applications for XML: to describe the user interface layout and components, to make remote procedure calls and to format configuration files. Light-weight Directory Access Protocol (LDAP) provides an interface to access information in directory servers. Directory services are commonly used to carry out three main requirements of Internet Protocol (IP) telephony: authentication, personalization and white pages. Configuration services allow for the management of IP phone **101** settings such as: device ID, network, dial-plans, audio (codecs, Dual Tone Multi-Frequency (DTMF), voice processing), call control, SIP related parameters, volume, display, date/time, authentication, security, voice mail, phone book, ringer behavior, power management, language, peripherals, and software management. These services also implement routines for automatic retrieval of phone configuration and software upgrades from a server. PC and PDA communications services provide an interface to communicate and collaborate with external user devices such as the PC and PDA. IP phone **101** should collaborate closely with these devices to share information, keep that information synchronized, and accomplish tasks more effectively.

Figure 8 illustrates the relationship between open-standard protocols **802** above the physical, data-link, and network layers **803** and the TADS protocol family and services **801** in accordance with an embodiment of the present invention. TADS protocol family and services **801** use open-standard communication protocols to exchange information with similar software components in other TADS-enabled devices. New protocols and services can be added to the existing pool by defining protocol and service types. These types are used by the TADS Client Protocol Engine **1101** (discussed below in connection with Figure 11) and TADS Server Protocol Engine **1006** (discussed below in connection with Figure 12) to direct TADS messages to their appropriate destination within a TADS-enabled client **1102** (discussed below in connection with Figure 11) or one of the TADS servers depicted in Figure 1. Each protocol or service defines its own message format and message sequence required to engage in providing or requesting such service. Examples of these services include, but are not limited to: enhanced wake-up services (provided by TADS Wakeup Call Server **108**) (Figures 14-21), enhanced data integrity methods (provided by TADS/YellowPages alarm server **108**) (Figures 22-25), enhanced merchant-customer interaction method (provided by RVCD **2402** (discussed in connection with Figure 24) in collaboration with IP phone **101**) (Figures 26-27), enhanced auto-conference methods (provided by SIP Server **109**, TADS Calendar Server **108**, Consumers Database **1208** (discussed in connection with Figure 12) in collaboration with IP phones **101**) (Figures 28-30), enhanced usage control methods (provided by TDS Server **108** and Consumer DB **1208** (discussed in connection with Figure 12) in collaboration with IP phones **101**) (Figures 31-32), and enhanced user experience methods provided by TA Distribution Engine **109** (discussed in connection with Figure 12) in collaboration with IP phones **101**) (Figures 33-41). Each of these services represents an embodiment of the current invention and contributes towards providing all services the TADS platform advertises.

Returning to Figure 5, platform **500** includes a layer 5 (domain-specific applications) **505**. Layer 5 **505** implements the business logic and the presentation logic used to run applications operating on IP phone **101** as illustrated in Figure 9.

Figure 9 illustrates an embodiment of an element of the present invention of layer 5 **505**. Referring to Figure 9, layer 5 **505** includes business logic **901** that provides the mechanisms to combine the services provided by underlying modules into coherent applications that add some value to the end user. Some components of business

logic **901** may run locally on IP phone **101** and some components will run remotely in an application server **108** (Figure 1). Some examples include extended calling features, phone directories, management and diagnostic tools, unified messaging, intelligent call management, instant messaging, contact management, personalized ring tones, call tracking, remote collaboration tools, and industry specific applications. It is at this layer that domain-specific differentiating features are implemented.

Layer 5 **505** further includes presentation logic **1102** that responds to the fact that the primary concerns of the User Interface (UI) module are the mechanisms of user interaction and how to lay out an appropriate presentation to the user in contrast with the primary concerns of business logic **901** are application domain policies and persistent storage interactions. The UI module may change according to customer's needs without changing the applications core functionality. For example, the same application domain modules with rich, web-based or text-based clients could be reused. Furthermore, the application module can be tested independently without resorting to awkward Graphical User Interface (GUI) scripting tools.

Returning to Figure 5, layer 4 **504** may be leveraged in the design of differentiated IP phones **101** via the following APIs. An operating system services API **506** provides common methods to access services provided by the operating system. For each specific operating system there is a module that supports the abstraction.

A Communication Infrastructure Services (CIS) API **507** provides common methods to access converged communication services available via the installed infrastructure. For each vendor-specific infrastructure there will be a module that will support the abstraction.

A Common Converged Communication Base Services (CCCBS) API **508** provides a standard method to access common converged communication services previously developed to satisfy a broad-range of converged communication domain-specific applications.

Platform **500** may be used to develop domain-specific applications (specific applications operating on IP phone **101**) for converged communication devices, to retarget one or more domain-specific applications developed for a specific IP phone **101** to a new hardware platform and/or operating system and/or communications infrastructure.

Figure 10 illustrates an embodiment of the present invention of an application hosting services ("AHS") architecture **1000** using software platform **500** (Figure 5) in IP phone **101**. AHS architecture **1000** may be used to facilitate the management of third-party applications operating on platform **500** (Figure 5) of IP phone **101**. This includes, but is not limited to: searching for suitable applications on the web, downloading host-able applications to the target, loading and running applications on the target, and security and protection mechanisms to protect other code and data on the target from malicious applications.

Figure 10 further illustrates an embodiment of the present invention of how transaction applications (TAs) in layer 5 (domain-specific applications) **505** are supported by software modules in layer 4 (CCCBS) **504** of software platform **500** in IP phone **101**. Please find presented three examples of domain-specific hosted applications as examples, namely: enhanced wakeup call service **1001**, autoconference service **1002** and data integrity service **1003**. Enhanced Wakeup Call Service **1001** is a series of services that allow users to setup profiles that will allow a TADS server **108** to, among other capabilities, adjust wakeup call times to account for real-time traffic and weather conditions and user calendar events. Autoconference service **1002** allows users to schedule and subscribe to conference calls that would then be automatically initiated without user intervention. Data integrity service **1003** allows commercial directory services (e.g., yellowpages) to be automatically

monitored for erroneous listings due to disconnected numbers, moved numbers, wrong numbers, etc. All three types of applications **1001-1003** can generate transactions, voice calls and other events that can be used to augment user profiles.

A TADS protocol stack **1004** in CCCBS layer **504** implements the communication protocols needed to distribute TAs, carry out transactions, and gather TA events. A TADS transaction manager **1005** in CCCBS layer **504** uses TADS protocol stack **1004** to carry out transactions with another transaction manager at TADS server **1201**. A TADS programming manager **1006** in CCCBS layer **504** receives and manages programming information from TADS server **1201** to schedule sponsored programming and other advertisements. Application Hosting Services (AHS) **1007** provide the environment needed by third-party applications in layer 5 **505** to run. A Secure Sockets Layer (SSL) module **1008** in CCCBS layer **504** provides secure transport of information between nodes of the network.

TADS client **1302** (discussed further below in connection with Figure 13) services can be shared by applications targeted for a broad range of domains, therefore reusing the code that provides the services and effectively shortening the development cycle of domain-specific applications.

Application hosting services architecture **1000** may further include RTOS services **1009** in operating system services layer **502** which is interfaced with platform drivers and hardware **1010**.

An embodiment of a client-server communications architecture for which software platform **500** (Figure 5) and methods that can be used to develop client converged communication terminal devices **101** that can support the distribution of value-added services to end-users is illustrated in Figure 11.

Referring to Figure 11, client-services communications architecture **1100** forms the basis of a Transactional Application Delivery System (TADS) for service providers and/or third party developers and content providers to rapidly develop, deliver, and manage revenue generating and productivity enhancing data-voice applications for IP phones **101**. Data-voice applications are those that take advantage of voice over Internet Protocol (VoIP) and/or POTS/Broadband infrastructures.

As illustrated in Figure 11, TADS server side elements **1101** communicate with TADS client side elements **1102**, e.g., IP phones **101**, via data network **102**, e.g., Internet. Client-services communications architecture **1100** has built-in flexibility allowing it to evolve with advancements in hardware, software, protocols, thus providing an extensive platform for delivery of applications and content. The following are among the main characteristics of software platform **500** (client-services communications architecture **1100**).

TADS **1100** provides an integrated download and content management system which enables the delivery of software and content to enabled devices. This download manager supports the entire process of software provisioning, including the submission of content and applications from third-party developers, testing and certification of those applications, bundling, pricing, demographics-based targeted promotions, and delivery to enabled terminals.

TADS **1100** further includes the capability to remotely, provision, configure, diagnose, or upgrade compatible devices (as described in Figures 42-43 below). This enables providing online help support to users and reducing the need for on premise visits. Through this capability, service providers are able to bring up new clients, push the latest software updates to the terminals, or remotely perform a move, add, or change to a customer's system.

TADS servers **1101** may process all voice and data before transmitting to the device. TADS servers **1101** communicate with devices **1102** to determine the optimal delivery, compression, and formatting of the information to be displayed on IP phone **101**. This content optimization will maximize the service providers use of available device resources ate at the customer's premise.

TADS **1100** further includes the capability of using open standard interfaces to enable quick and easy integration with a carrier's existing systems and third party equipment and software.

Furthermore, all software components of TADS **1100** incorporate redundancy and load balancing to provide a very high level of service availability. To enable carrier grade reliability, TADS servers **1101** route all voice and data traffic to other servers should it encounter any hardware or software failures. TADS **1100** provides scalability simply through the addition of servers. A more detailed description of TADS **1100** is provided below in association with Figure 12 and 13.

Figure 12 illustrates an embodiment of the present invention of the server side of TADS **1100**. Referring to Figure 11, TADS **1100** includes a server side **1101** and a client side **1102**. It is noted that TADS server **1101** refers to server 108 (Figure 1) and that TADS client **1102** refers to IP phone **101** (Figures 1 and 3-4).

Referring to Figure 12, TADS server side elements **1101** include a front-end console **1201** that allows administrators to submit, via a web-based interface (not shown), multi-media content, define the demographic/profile characteristics of the target audience, schedule the dates and times when applications and services should be distributed, and charge for the services if applicable.

TADS server side elements **1101** further include a TADS server protocol engine **1206** that handles all communications using the TADS protocol on the server side for handling transactions, distributing applications and services, subscribing clients to distribution groups and delivering products to clients.

TADS server side elements **1101** further include various server software modules and databases **1205** on top of which telephony applications **1203** and converged voice-data applications and services may be constructed **1204**. TADS server side elements **1101** further include a settlement manager **1202** that maintains a log of all end-user actions during a converged communications session that can then be used to determine profit allocation throughout the value chain (merchants, content providers, service providers, and the owner of the content distribution platform) as well as to obtain valuable closed activity reports that may be used to drive new services and log valuable demographic data on all end-user transactions. TADS heartbeat process **1207** informs other TADS-enabled devices about its processor load and other transient data by sending periodic heartbeat messages. A proxy server **120** (Figure 1) can be used to distribute requests for TADS services among several TADS servers **108** (Figure 1), content media servers **119** (Figure 1) and converged messaging and directories servers **110** (Figure 1) so as to balance the load uniformly throughout all of them or to avoid sending requests to servers that have become unavailable. Unavailable servers are servers for which heartbeat messages have not been received for some configurable period of time. They can be considered to be infinitely loaded with requests for service. The TADS server software modules and databases are described in more detail in Figure 14, as discussed further below.

Figure 13 illustrates an embodiment of the present invention of the client side of TADS **1100**. The client side includes the TADS Client Protocol Engine **1301** that handles all communications using the TADS protocol on the client side for handling transactions, executing applications and accessing services. The client side also

includes various TADS client software modules **1302** and databases that are described in greater detail in Figure 15, as discussed further below.

Referring to Figure 14, TADS front-end (console) **1201** may be configured to be a front-end to the Transactional Applications Delivery System (TADS) programmatic API **1403**. TADS front-end (console) **1201** presents a selective view of all the data accessible to programmatic API **1403**. This includes custom graphical user interfaces, web-based interfaces, command line interfaces, and others. Customized front-ends can be developed by third-parties also.

TADS programmatic APIs **1403** expose all aspects of the TADS framework to calling applications. This includes browsing (read, write, delete, add) information on consumers, vendors, billing, channel definitions, transactions, content and distribution groups.

TADS server side elements **1101** further include a vendor management module **1404** configured to allow access to a vendor database **1405**. Vendor management module **1404** may be an adapter to communicate with an existing system or internal vendor database **1405**. All the information regarding vendors is stored and accessed through vendor management module **1404**. Vendor management module **1404** can be used by a content programming module **1406** to get vendor information. Vendors buy advertisement space/time on IP phone **101** and get orders from customers through IP phone **101**.

TADS server side elements **1101** further include a demographics module **1407** configured to access a consumer database **1408** and apply rules to query records that show specific demographic characteristics. Demographics module **1407** may further include an adapter to communicate with an existing system or an internal consumer database **1408**.

TADS server side elements **1101** further include a user management module **1409**. Users of TADS-enabled clients may be regarded as consumers by the vendors using TADS. Users can be added, changed or deleted through the use of user management module **1409**. All information regarding users is accessed through user management module **1409**.

TADS server side elements **1101** further include content programming module **1406**, as mentioned above. Content programming module **1406** is involved in defining the distribution and exposition of advertisements throughout the network of TADS-enabled clients, e.g., IP phone **101**. Advertisements are exposed at the remote clients by the transactional applications distributed by TADS server **1101**. Vendors can use the graphical user interface exposed by TADS front-end **1201** to access content programming module **1406**. Content programming module **1406** may be used to create distribution groups for advertisements and to schedule showing time among the clients in the group. Vendors can define distribution and level of exposure for an advertisement using criteria such as user demographics, geographical or organizational boundaries and buying history. The resulting scheduling information is stored in a distribution group schedule database **1410**.

TADS server side elements **1101** further include a transaction engine **1411**. Transaction engine **1411** is an engine that autonomously handles transactions from TADS clients **1102**. Transaction engine **1411** may be configured to keep records of all transactions handled. Transaction engine **1411** may also access a billing database **1412** (or an external billing system). Transaction engine **1411** can also change consumer database **1408** to reflect particular information about consumer buying behavior in consumer database **1408**. Transactions are started by clients **1102**. A transaction starts with a user selecting a service or application on a TADS-enabled device **1102**. Client and server exchange session details and after the request is confirmed the product is delivered

(when appropriate) over network **102**. A transaction ends when the product is delivered to the TADS-enabled device, e.g., IP phone **101**.

TADS server side elements **1101** further include TADS server protocol engine **1206**, as mentioned above. TADS server protocol engine **1206** may be configured to handle all communications using the TADS protocol on the server side. The TADS communication protocol is used for handling transactions, distributing advertisements, subscribing clients to distribution groups and delivering products to clients **1102**.

TADS server side elements **1101** further include a Transactional Applications (TA) distribution engine **1413**. TA distribution engine **1413** may be used to distribute Transactional Applications (TA) to TADS-enabled clients **1102**, e.g., IP phones **101**. TA distribution engine **1413** may be configured to look up the scheduling database for TAs to distribute and to use TADS protocol engine **1206** to send them to the appropriate destinations. Destinations are defined as groups of TADS-enabled clients **1102** that have been identified as having the appropriate channels to handle the TA to be sent. Transactional applications are chartered with the task of advertising a product and completing a sell transaction from a network of TADS-enabled clients **1102**.

Channels of content are created according to needs based on demographics information (managed by the demographics module - **1407**, and stored in the consumer DB **1408**) and vendor requests (managed by Vendor Management Module **1404** and Vendor DB **1405**). Each channel may have different characteristics, including, but not limited to size and position of display (screen "real estate"), content type provided by channel (static or animated images, sound, voice messaging, multimedia (integrated visual and sound elements, even applications, etc.), duration of exposure per event shown (10sec, 30sec, 30 min), time and frequency of exposure ("prime time," "red eye," "repeat every 10 minutes," etc.), rule based exposure ("show during calls," "show when user searches for pizza," etc.) target demographics (e.g. "shown in luxury suites," "shown in metro area," "shown in technical office parks," etc.), numerical exposure rating (100 TADS enabled devices, 100,000 TADs enabled devices), and device based exposure rating ("TADS enabled phones," "TADS enabled PCs," "TADS enabled PDAs"). Based on channel characteristics, vendor profiles and demographics information, the content programming module **1406** can create channels of content distribution. Each channel will have, based on it's characteristics and sales agreements reached with vendors (possibly by auctioning time on channels), costs associated with putting information in the channel. This information will be used by the billing manager **1416** to bill **1412** vendors for time used in the channels. Some channels may have different costs and characteristics at different times of day ("prime time" costs may be larger than "red eye" costs, for example). Also, TADS **1101** could assign different channels to TADS enabled devices based on the TADS enabled devices **1102** group information (managed by the Group Subscriber/Unsubscriber module **1414**, and stored in the Distribution Group Schedule **1410**).

TADS server side elements **1101** further include a group subscription manager module **1414** configured to handle the subscription and un-subscription of TADS-enabled clients **1102** for each distribution group. A distribution group contains an identifier for each of TADS-enabled clients **1102** that are members of the group. Subscription can take place at client registration time or it can be initiated by the server whenever a TA is scheduled for distribution. The subscription process delivers scheduling information for a TA to TADS-enabled clients **1102**.

TADS server side elements **1101** further include a product delivery engine **1415** configured to assist transaction engine **1411** to complete a sale by delivering a product purchased to TADS-enabled client **1102** whenever possible.

TADS server side elements **1101** further include a billing manager module **1416** used to access billing information. Billing manager module **1416** may include an adapter to communicate with an external billing system or internal billing database **1412**.

Billing database **1412** may contain information on sales done on behalf of vendors through TADS and TA distribution charges. Vendors are billed by service providers for their use of TADS. It can also handle service-usage billing.

Other databases in TADS server side elements **1101** include a transaction database **1417** configured to contain records of all transactions enabled by TADS.

Another database in TADS server side elements **1101** is vendor database **1405**, as mentioned above. Vendor database **1405** contains vendor information.

Another database in TADS server side elements **1101** is consumer database **1408**, as mentioned above. Consumer database **1408** contains all information related to consumers. Consumers are the users of TADS-enabled clients **1102**.

Another database in TADS server side elements **1101** is distribution group schedule database **1410**, as mentioned above. Distribution group schedule database **1410** contains information on what devices should get what TAs and at what times they should be shown.

Another database in TADS server side elements **1101** is a content database **1418**. Content database **1418** contains products and TAs to be delivered by TADS server **1101**.

Referring to Figure 15 elements of TADS client **1102** include a TA programming manager module **1505** configured to receive subscription requests from servers through a TADS client Protocol Engine **1301**. TA programming manager module **1505** may be configured to keep track of what TAs are expected through each channel at specific times and where in the phone user interface they should be rendered.

TADS Client Protocol Engine **1301** may be configured to handle all communications using the TADS protocol in each client. The TADS communication protocol is used for handling transactions, distributing advertisements, subscribing clients to distribution groups and delivering products to clients **1102**.

Client side elements **1102** may further include a TA execution engine 15 configured to execute a TA at the client, e.g., IP phone **101**. The TA uses a transaction broker module **1508** to engage in transactions with TADS server **1101**. TA execution engine **1503** also renders advertisements on the user interface of the TADS-enabled client **1102**, e.g., IP phone **101**.

Client side elements **1102** may further include a UI event handler **1506**. UI event handler **1506** is not provided by the TADS framework. It is part of the infrastructure of TADS-enabled client **1102**. UI event handler **1506** gets events from the UI of TADS-enabled client, e.g., IP phone **101**, and forwards them to transaction broker module **1508** and TA execution engine **1503**.

Transaction broker module **1508** interacts with transaction engine **1501** at TADS server **1101** through TADS client protocol engine **1101**. Transaction broker module **1508** helps TAs to complete transactions.

Client side elements **1102** may further include a product installer module **1507** configured to install products in database **1502** delivered through the TADS framework.

Client side elements **1102** may further include a product downloader module **1501** which interacts with the product delivery engine at TADS server **1101** through TADS client protocol engine **1101**. Product downloader module **1501** downloads products purchased through TADS.

Client side elements **1102** may further include a group and channel bindings database **1504** which contains information on what TAs will be delivered through each distribution group and when and where in the UI their advertisements will show up.

Installed applications database **1502**, as mentioned above, will hold all applications installed through TADS.

It is noted that the embodiment of the server and client sides of TADS **1100** may include other and/or additional modules that for clarity are not depicted. It is further noted that TADS **1100** may be implemented with a different combination of modules and that those presented in the discussion of Figures 12-15 are illustrative.

Additional details regarding the TADS as described above are disclosed in the U.S. Patent Application, filed on March 17, 2005, entitled "Internet Protocol (IP) Phone with Search and Advertising Capability," with the serial number of 11/082,361, which is hereby incorporated by reference in its entirety.

Example services enabled by an embodiment of the present invention, as discussed in conjunction with Figures 1 and 11-15, include, but are not limited to: enhanced wake-up services (provided by TADS wakeup call server **108**) (Figures 16-23), enhanced data integrity methods (provided by TADS/YellowPages alarm server **108**) (Figures 24-27), enhanced merchant-customer interaction method (provided by Remote VoIP Call Dispatcher (RVCD) **2402** (discussed in connection with Figure 28) in collaboration with IP phone **101**) (Figures 28-29), enhanced auto-conference methods (provided by SIP server **109**, TADS calendar server **108**, consumers database **1208** (discussed in connection with Figure 12) in collaboration with IP phones **101**) (Figures 30-32), enhanced usage control methods (provided by TDS server **108** and consumer database **1208** (discussed in connection with Figure 12) in collaboration with IP phones **101**) (Figures 33-34), and enhanced user experience methods provided by TA distribution engine **109** (discussed in connection with Figure 14) in collaboration with IP phones **101**) (Figures 35-41). Each of these services represents an embodiment of the current invention and contributes towards providing all services the TADS platform advertises.

The following presents a discussion of the exemplary services or applications mentioned above in connection with Figures 16-41 that leverage the TADS building blocks discussed in Figures 11-15 and software platform **500** (Figure 5). Consequently, each of these Figures, Figures 16-41, will be discussed below in connection with Figures 1-13.

The TADS Wakeup Call Server (TWCS) **108** controls the service execution and configuration. A vendor server **118**, a unified messaging server **110**, a content and media server **119** collaborate with the TWCS via a data network **102** to deliver the specific service that the user requests via IP phone **101**. IP phone **101** receives the wakeup call and enables all the other enhanced services described in association with Figures 16-23.

The enhanced wakeup services depend on the user being able to create and store personal preferences or profiles directly at IP phone terminal **101** or through a configuration portal to wakeup server **108** using a web browser. The configuration sequence is presented in Figure 16. Figure 16 is a flowchart of a method **1600** for creating and storing personal preferences or profiles via a configuration portal to wakeup server **108**. Referring to Figure 16 in conjunction with Figure 1, in step **1601**, the user logs on to wakeup server **108**. In step **1602**, if wakeup server **108** validates the user's authentication credentials, wakeup server **108** provides the user access to a main configuration page. In step **1603**, the user adds, modifies or deletes any of the following configuration parameters: wakeup calls, rules for their scheduling (recurrence) and wakeup sound preferences; snoozing patterns: interval between calls, for how long, wakeup sound; task and appointment lists (manually or through synchronization with another server); sources of information feeds and categories of interest: news, weather,

sports, travel itineraries. For example, wakeup server **108** can adjust automatically the wakeup call settings based on rules that the user specifies. The input parameters for these rules can be information available on the network or on the user's profile (weather and traffic conditions, early morning appointments, hotel checkout time, travel schedules, etc). Alternatively, wakeup server **108** can suggest to the user the proposed changes to the settings instead of changing them automatically so that the user can verify and approve them. Some specific situations where this can be applied are the following. Wakeup server **108** automatically schedules the wakeup call some time earlier than ordinary due to a sudden traffic jam in my route to work or to the airport. In another example, wakeup server **108** suggests a change in a recurrent wakeup call due to an early morning appointment at work, with the doctor, with mechanic or with friends for a trip. In another example, wakeup server **108** can employ information from the user's travel itinerary to create or suggest wakeup call settings in advance. In another example, wakeup server **108** can look up in the network the estimated time of arrival from the hotel to the airport (considering distance and traffic conditions) and adjust the time accordingly. Wakeup server **108** may even consider the differences in time zones. Vendors can log into the TADS server in the same way as a regular user and can associate and schedule advertisements, services and offers to wakeup calls.

It is noted that method **1600** may include other and/or additional steps that, for clarity, are not depicted. It is further noted that method **1600** may be executed in a different order presented and that the order presented in the discussion of Figure 16 is illustrative. It is further noted that certain steps in method **1600** may be executed in a substantially simultaneous manner.

Figure 17 shows the high-level state machine diagram of the wakeup service in accordance with an embodiment of the present invention. The process is composed of three states: making a call (**1702**), awake (**1703**), and snooze (**1704**). The process begins at a start point (**1701**) and ends at an end point (**1705**). The process starts at start point **1701** when wakeup server **108** initiates the call and phone **101** starts ringing or answers the call automatically. If the user confirms the wakeup call, i.e. indicates wakeup server **108** that he/she is awake, then it transitions to awake state **1703**. Once in awake state **1703**, wakeup server **108** can start pushing into phone **101** the enhanced services described below (reminders/alerts). If the user does not confirm the wakeup call and the user activated the snooze feature in his/her profile, the state machine will transition to snooze state **1704**. It will stay here for a given amount of time depending on the user's profile and then transition to making call state **1702** to try the wakeup call once again.

There are two main scenarios associated with an enhanced wakeup call. In the first scenario phone **101** automatically answers the call. This scenario is described in Figure 18. In the second scenario, the user answers the call. This scenario is described in Figure 19.

Figure 18 shows (via arrows as indicated below) the sequence of events associated with phone **101** (Figure 15) automatically answering a wakeup call in accordance with an embodiment of the present invention. Wakeup server **108** makes a call to IP phone **101** at the time of the wakeup call (arrow **1802**). The call is flagged as a wakeup call. IP phone **101** examines the identity of the incoming call (arrow **1803**) and automatically answers it if in fact it is a wakeup call (arrow **1804**), thus signaling wakeup server **108** via the call answered signaling (arrow **1805**). Wakeup server **108** contacts media server **119** to indicate user preferences, i.e., what sound will be transmitted (arrow **1806**). Wakeup server **108** connects the local end of the media channel to media server **119** to transmit audio on real time (music, pre-recorded message, and live morning news) to phone **101**. When user **1801** wakes up, user **1801** will provide confirmation to wakeup server **108**, either hanging up the call or choosing to

keep listening to media stream (arrow **1807**). Any of these two actions will indicate to server **108** that the wake up call was successful (arrow **1808**). If user **1801** does not carry out any of these two actions, server **108** disconnects the call after a given elapsed time and assumes that the wake up call was unsuccessful. After an elapsed time, user **1801** will finish the wakeup session (arrow **1809**).

Figure 19 shows (via arrows as indicated below) the sequence of events associated with user **1801** answering a wakeup call in accordance with an embodiment of the present invention. Wakeup server **108** makes a call to IP phone **101** at the time of the wakeup call with an identity that phone **101** can recognize as a wakeup call (arrow **1901**). Terminal **101** starts ringing upon receiving the wakeup call. Since phone **101** can recognize the incoming call as a wakeup call, it can play the appropriate ringtone according to the current user configuration (arrow **1902**). Ringtones can go beyond simple cadenced patterns and include more complex sound files such as short music clips and relaxing sounds (stored in the phone's non-volatile memory). When user **1801** wakes up, user **1801** will answer the call (arrow **1903**) and the terminal will signal wakeup server **108** that the call was answered (arrow **1904**). Wakeup server **108** will connect the phone to media server **119** which will start transmitting the configured audio stream (arrow **1905**) while the media session remains established (arrow **1906**). User **1801** will provide confirmation to server **108** that he/she is awake, either hanging up the call or choosing to keep listening to the input audio stream (arrow **1907**). If user **1801** does not pickup phone **101**, server **108** will disconnect the call after a given elapsed time and assume that the call was unsuccessful. After an elapsed time, user **1801** will finish the wakeup session (arrow **1908**).

The wakeup service described above can also provide a snooze feature similar to the one found in digital alarm clocks. In this case, wakeup server **108** initiates a wakeup call that can either be answered automatically by phone **101** or by user **1801**. If the wakeup call fails (i.e., the user does not provide confirmation), server **108** will try again depending on the user configured callback settings. The wakeup call is unsuccessful if the user does not confirm the call in a given amount of time. Server **108** continues to initiate wakeup calls and check for success until it reaches a give-up condition specified in the configured user's profile. The number of times that server **108** calls back and the interval between calls can be customized for each user. For example, server **108** can call back every 10 minutes for half an hour with a relaxing sound and then after that period try a stronger sound at shorter intervals. If no answer is received, the system could trigger an alarm that would signal appropriate personnel to check on the well-being of the person for whom the wakeup call was setup (retirement home, hospital, hotel, etc).

Figure 20 shows (via arrows as indicated below) how the wakeup service can remind user **1801** of a special date in the calendar such as birthdays and anniversaries in accordance with an embodiment of the present invention. It allows user **1801** to arrange to buy and deliver a gift if appropriate. TADS/Wakeup server **108** and user **1801** establish a wakeup call that can either be answered automatically by phone **101** or by user **1801** (arrow **2005**). Server **108** notices that today there's a birthday or anniversary entry in the user's calendar. Server **108** suggests a list of gift options (flowers, chocolates, book, etc.) (arrow **2006**). User **1801** chooses a gift option (arrow **2007**). Server **108** provides a list of local vendors for the gift category (arrow **2008**). User **1801** selects a vendor from the list (arrow **1809**). IP phone **101** downloads a transactional application (arrow **2010**) to allow user **1601** to select, pay and arrange delivery of the gift (arrow **2011**). User **1801** interacts with IP phone **101** to place the order. Phone **101** posts the transaction with server **108**. TADS server **108** posts the transaction with the particular vendor server **118**. Alternatively, user **1801** could call the vendor with just the press of a button to place the order since TADS server **108** could already provide the contact number.

Figure 21 shows (via arrows as indicated below) how the wakeup service can alert user 1801 of special entertainment events that might be of his/her interest and allow user **1801** to reserve or buy tickets to these events in accordance with an embodiment of the present invention. TADS/Wakeup server **108** and user **1801** establish a wakeup call that can either be answered automatically by phone **101** or by user **1801** (arrow **2101**). Server **108** notices the date and provides user **1801** with a list of weekend activities (concerts, movies, theater, conferences, trip special packages) that matches a list of interests in the user's profile stored in server **108** (arrow **2102**). User **1801** chooses an activity from the list (arrow **2103**). Phone **101** downloads an application (arrow **2104**) to allow user **1801** to buy tickets and make/confirm reservations (arrow **2105**). User **1801** interacts with IP phone **101** to place the order. Phone **101** posts the transaction with server **108** (arrow **2106**). TADS server **108** posts the transaction **1811** with particular vendor server **118** (arrow **2107**).

A combination of the services described in association with Figures 20 and 21 can be envisioned for the hospitality industry. The wakeup service shows user **1801** what is available in the hotel restaurant menu or the list of activities/tours for the day. Server **108** and user **1801** establish a wakeup call. Server **108** shows user **1801** the hotel restaurant breakfast menu and a list of activities for the day. Phone **101** downloads an application to let user **1801** order room service for breakfast or reserve tickets for a given activity.

Figure 22 shows (via arrows as indicated below) how the wakeup service can send the user **1801** urgent unread emails or voicemails that arrived during the night and that may require immediate attention during the morning in accordance with an embodiment of the present invention. TADS/Wakeup server **108** and user **1801** establish a wakeup call that can either be answered automatically by phone **101** or by user **1801** (arrow **2201**). Server **108** requests messaging server **110** for information of new urgent emails or voicemails during late hours for the current user (arrow **2202**). Alternatively, messaging server **110** can notify wakeup server **108** when a new message arrives. Then, server **110** can check if there are any messages logged at the time of the wakeup call. Phone **101** downloads an application to let user **1801** see and hear the list of urgent messages and answer any if appropriate (arrow **2203**). User **1801** browses the message list (arrow **2204**) and requests (arrow **2205**) more information for a particular message. Phone **101** shows the text or plays the selected message (arrow **2206**). After reviewing a message, user **1801** can use phone **101** to answer if appropriate (arrow **2207**).

Figure 23 shows (via arrows as indicated below) how the wakeup service can send user **1801** the information that might be of interest while waking up (usually during the morning) such as news headlines, local weather conditions, sport results, and stock quotes (collectively referred to as "newspaper material") in accordance with an embodiment of the present invention. TADS/Wakeup server **108** and user **1801** establish a wakeup call that can either be answered automatically by phone **101** or by user **1801** (arrow **2301**). Server **108** sends a list of information categories to choose from based on the user's preferences (arrow **2302**). User **1801** selects the information category he/she wants to browse (arrow **2303**). Server **108** sends phone **101** the application to present the information to user **1801** (arrow **2304**). Each category of interest may initiate a download from content server **119**, vendor server **118**, or TADS/wakeup server **108** (arrows **2305**, **2306**, **2307**). Server **108** shows the user (arrow **2308**) information of personal interest during the morning such as: task list and appointments for the day, news headlines, local weather, traffic conditions, sport results, inspirational/funny quotes and cartoon strips. User **1801** may initiate a transaction based on an advertisement posted by TADS server **108** along with the information of interest (arrow **2309**). Server **108** sends the transactional application (arrow **2310**). The transaction is setup by

user **1801** via IP phone **101** (arrow **2311**). The transaction is posted to TADS server **108** (arrow **2312**) and ultimately to vendor server **118** (arrow **2313**).

A service enabled by an embodiment of the present invention related to the development of enhanced data integrity methods that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate the maintenance of digital directories, such as yellow pages, is discussed below in association with Figures 24-26. That is, Figures 24-26 disclose a method for identifying phone numbers made by a user of IP phone **101** that did not contact intended recipients. Further, Figures 24-26 disclose a method for identifying a failed directory search of a contact performed by a user of IP phone **101**.

The enhanced methods are based on the availability of a so-called TADS/YellowPages (YP) alarm server **108** (discussed further below in connection with Figure 24) that has a mechanism by which it can receive an alarm from an IP Phone **101** indicating a failure to complete a call to a particular phone number or URI. This alarm mechanism can be either manual via UI event handler **1506** or automatically triggered by the error response code to the call. The alarm can be classified as critical (generated manually) or info (generated automatically). In both cases, an administrator **2408** (Figure 24 as discussed below) has the ability to select the failure threshold that will lead to the alarm generation.

Figure 24 shows (via arrows as indicated below) the sequence of events associated with the selectable failure threshold – manual solution in accordance with an embodiment of the present invention. Referring to Figure 24, a telephony services server **109** sends a wrong number (a number which the user tries to reach but turns out to be the wrong number) and/or SIP/H323 error message **2401** to IP phone **101** together with an error sound or announcement. IP phone **108** displays a "broken link" type of button via the interface provided by UI event handler **1506**. The user will trigger the alarm report by pressing on the button. This action will send a "critical alarm" message (arrow **2402**) to TADS server **108** (via the transaction broker module **1508** and TADS client protocol engine **1301**), indicating a "bad phone number." The critical alarm message will cause TADS server **108** to increment the corresponding alarm count for the called number (arrow **2403**). Once the alarm count of a phone number reaches the selected failure threshold, the number will be flagged (arrow **2404**) and displayed on TADS front end console **1201**. Directory administrator 2208 would then see the flagged number (arrow **2405**) and would launch an investigation to determine why the failure is occurring (disconnected number, changed number, etc.) (arrow **2406**). Once the cause of the failures is determined, administrator **2408** proceeds to update the database to avoid future call failures (arrow **2407**).

Figure 25 shows (via arrows as indicated below) the sequence of events associated with the selectable failure threshold – automatic solution in accordance with an embodiment of the present invention. Referring to Figure 25, telephony services server **109** sends a SIP error message (with any of the following SIP error codes: **301, 404, 410** and **604**) to IP phone **101** (arrow **2501**). Upon receiving the error message, IP phone **101** will generate an info alarm (arrow **2502**) that will be sent to TADS server **108** (via the TA execution module **1303** and TADS client protocol engine **1301**), indicating a "bad phone number." The info alarm message will cause TADS server **108** to increment the corresponding alarm count for the called number (arrow **2503**). Once the alarm count of a phone number reaches the selected failure threshold, the number will be flagged (arrow **2504**) and displayed on TADS front end console **1201** Directory administrator **2408** would then see the flagged number (arrow **2505**) and would launch an investigation to determine why the failure is occurring (disconnected number, changed number,

etc.) (arrow **2506**). Once the cause of the failures is determined, administrator **2408** proceeds to update the database to avoid future call failures (arrow **2507**).

Figure 26 shows (via arrows as indicated below) the detailed sequence of events associated with the selectable failure threshold applicable to both the manual and automatic methods previously described in accordance with an embodiment of the present invention. Referring to Figure 26, telephony services server **109** sends a SIP or wrong number (a number which the user tries to reach but turns out to be the wrong number) error message (with any of the following SIP error codes: **301**, **404**, **410** and **604**) to IP phone **101** (arrow **2601**). Upon receiving the error message, IP phone **101** will send a message to TA execution engine **1303** (arrow **2602**), UI event handler **1506** waking the system with an alarm. TA execution engine **1503**, UI event handler **1506** deliver the alarm to transaction broker module **1508** (arrow **2603**), which in turn delivers the alarm to TADS client protocol engine **1101** (arrow **2604**) so that it can be forwarded using the TADS protocol to TADS server protocol engine **1206** (arrow **2605**). TADS server protocol engine **1206** reports the alarm to transaction engine (alarm manager) **1411** (arrow **2606**) which increments the corresponding alarm count (arrow **2607**) and records it on transaction database **1417**. If the thresholds are met, transaction engine (alarm manager) **1411** will flag the phone number (arrow **2608**) and display on TADS front end console (alarm viewer) **1201**. Once alarm administrator **2408** sees the flagged number (arrow **2609**), he/she will launch an investigation (arrow **2610**) and if appropriate will update (arrow **2611**) the yellow pages database **1418**.

In both the manual and automatic methods described above, TADS server protocol engine **1206** will receive the alarms and will store them on transaction database **1417** until they are cleared or saved into an alternative location. An alarm manager application will be monitoring the alarms or alarm counts depending on the administrator configured data. This application will make the alarms available to the system administrator by displaying them using TADS front-end console **1201**. The yellow pages administrator can view a report of the flagged numbers in order to start an inquiry about the validity of a particular alarmed or flagged number. The alarm mechanism can be implemented either by using SIP (SUBSCRIBE/NOTIFY) messages, SNMP based traps or similar protocols and services. If SNMP is used, the object identifiers for the management information base and the way they should be interpreted defines this part of the TADS communications protocol. If the SIP SUBSCRIBE/NOTIFY mechanism is used, then the schema of the XML files exchanged with the two kinds of messages defines the TADS communication protocol for this service. TADS client protocol engine **1301** can provide programmatic interfaces to creating and parsing said objects or files. Note that the methods described above use alarms as the primary type of event, but it could be extended to use other events in order to create more elaborate schemes to update the directory databases. For example, traffic measurements could be used where the number of yellow pages local searches made against number of local searches that ended generating a call is used as a performance indicator.

In both the manual and automatic methods described above, the content of alarm messages may include the ID, severity (Info, Critical, Other), type (contact, graphics, etc.), query, query return, error source, and cause source. The error triggers may be generated by IP phone **101**. Error sources may include IP phone **101**, dial plan, or null searches (search returning a contact with no phone number). The cause code may include blank number, garbled number, (letters instead of numbers), SIP error code, manual (user notifies the error), etc. The alarm type may include wrong graphics or phone numbers.

A service enabled by an embodiment of the present invention related to the development of a self-fulfillment method that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate the management of phone directory updates is discussed in association with Figure 27.

Often times a vendor may have to transfer phone lines from one location to another. While the phone numbers remain the same, the geographical location associated with them changes. It takes many months for service providers to update their systems to reflect the change. This could lead to a potential loss of customer leads when customers search for local merchants.

Figure 27 is a flowchart of a method **2700** for facilitating the management of directory updates via vendor self-fulfillment in accordance with an embodiment of the present invention. Referring to Figure 27, in step **2701**, the vendor connects to TADS server **108** via front end Console **1201** and gains access to his records via vendor management module **1404**. In step **2702**, the vendor updates, corrects, or sets up the contact info associated with the phone lines of interest. In step **2703**, TADS server **108** generates a validation code that is sent, along with a phone number to call, to the vendor's email address. In step **2704**, the vendor calls the phone number provided by the TADS server from the line for which contact information was updated (with caller ID enabled) and when prompted enters the validation code. In step **2705**, TADS server **108** generates a new email or fax that is sent to the vendor indicating that the phone line contact info has been successfully updated.

It is noted that method **2700** may include other and/or additional steps that, for clarity, are not depicted. It is further noted that method **2700** may be executed in a different order presented and that the order presented in the discussion of Figure 27 is illustrative. It is further noted that certain steps in method **2700** may be executed in a substantially simultaneous manner.

A service enabled by an embodiment of the present invention related to the development of enhanced merchant-customer interaction methods that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate communication among said parties is discussed below in association with Figures 28-29. Specifically, a "click to dial" and a "more info" solution are presented. The "click to dial" solution allows an end-user to click on a button placed on a participating merchant's webpage leading the end-user's IP phone in turn to place a call to the corresponding number. The "more info" solution allows an end-user to click on a button placed on a participating merchant's webpage or phone-based advertisement leading the merchant to place a call to the end-user's IP phone.

Figure 28 shows (via arrows as indicated below) the sequence of events associated with the "click to dial" enhanced merchant-customer interaction method in accordance with an embodiment of the present invention. A browser plug-in or small application called a Remote VoIP Call Dispatcher (RVCD) **2802** would be installed on the user's personal computer. This software would be configured with IP phone **101** information for the user in the form of a URI. Alternatively, an IP phone **101** auto-discovery mechanism can be implemented where RVCD **2802** broadcasts to its subnet a request for identification to all listening IP phones **101**. IP phones **101** will respond to the request with an TADS echo message indicating Internet Protocol contact information, and credentials to be authenticated by the requester. This can also be accomplished if IP phone **101** broadcasts periodically a SIP message invocating a SUBSCRIBE method with all the information needed by the RVCD **2802**. Web server **108** will contain advertisement pages **2801** which will be formatted with SIP based URIs. Upon the end-user 2801 clicking on an advertisement (arrow **2803**), phone number or SIP URI, the web browser will pass the URI (arrow **2804**) to RVCD **2802**. Once RVCD **2802** receives the target URI, it will send a SIP

message invocating the REFER SIP method (arrow **2805**) to the user's IP phone **101** in order to generate a new call towards the merchant **1801** contact (arrow **2806**). Alternatively, RVCD **2602** could send a NOTIFY message (arrow **2805**) to IP Phone **101** using information previously received by RVCD **2802** in a SIP SUBSCRIBE message, to generate the new call (arrow **2806**), but the preferred method is to use the REFER method. Once the call is accepted, conversation is established (arrow **2807**).

Figure 29 shows (via arrows as indicated below) the sequence of events associated with the "more info" enhanced merchant-customer interaction method in accordance with an embodiment of the present invention. A local HTML page **2801** will be available to the local end-user's **1801** personal computer. This page **2801** will contain a form that once filled, it will generate a cookie which will be stored on personal computer **1801**. The cookie will contain the contact information for the user (URI, telephone number, etc.). Alternatively, page **2801** served by web server **108** should also contain a way to request the contact info in case the cookie is not available. Web server **108** will contain an application which would be used to track and manage the "request more info" transactions. The request for info transactions will be presented in a sequential manner on a GUI available through this application. These request for info transactions could be a one time only transaction as well as a subscription transaction. In case of a subscription transaction, the requester can select how to get the subscription content by e-mail or by targeted advertisement on IP phone **101**. Web server **108** will serve specially formatted advertisement pages (arrow **2901**) that will contain a Java Script which will be used to fill up a hidden form by reading the cookie previously generated by the local page when the page is loaded by the web browser. Alternatively, the page served by web server **108** should also contain a way to request the contact info in case the cookie is not available. These pages can be considered to be TADS transaction applications. The cookie can be considered a user's profile. When end-user **1801**, who is browsing the page, clicks on the "request for more info" link (arrow **2902**), the browser will send the form towards the server (arrow **2903**). This form will have a set of values (item ID, topic ID, inventory ID) hard-coded at server **108** which will be used to determine the request for info type. Upon receiving the form by TADS server **108**, the information would be saved in a database **808** (arrow **2904**) and presented to a user (arrows **2905, 2906, 2907**) through TADS front end console **1201** previously described for a customer representative **2808** to use. The front-end console will be provisioned so that it retrieves content periodically from the database (arrow **2905**). Once the new requests are obtained from the database (arrow **2906**), they will be displayed on the front-end console. At this point, customer representative **2808** will call the client in order to provide the requested information (arrow **2908**). Alternatively, customer representative **2808** will send the targeted content to IP phone **101** (arrow **2909**). The information retrieved through the form can be used in order to collect and store demographic statistics.

A service enabled by an of the present invention related to the development of enhanced auto-conference call methods that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate the automatic generation and management of conference calls is discussed below in association with Figures 30-32. Three methods are presented based on phone synchronization, phone subscription, and server hosted conferences.

The enhanced methods are different from current ones in that TADS enabled user-profiles can be set up to be combined with the user's calendar, directory and profile settings to automatically manage conference-calls based on the desired rules. For example, a user would not have to remember to set call forwarding at a particular time or to reschedule a scheduled conference call to another time due to a scheduling conflict. The users could

create rules taking into consideration the user's calendar, directory and profile settings. For example, the user could create a rule that indicates that "from 6 am to 6 pm, if calendar indicates meeting, then forward calls to <phone 2>." TADS-based user-profiles allow for mobility of information so that all TADS-enabled communication devices could load your user profiles without the need for programming the rules in each location. The integration of the user's calendar, the user's profile and rules allows more freedom for users and allows for enhanced responses by combining the rules with finer grained functionality (e.g., the users do not have to remember to set the vacation message in the phone). The users can set a rule that whenever the calendar says out of the office, the phone will send the vacation message indicating when the user will come back, except for calls from phone-X which will be automatically forwarded to phone-Y.

The methods described herein are based on user-profiles. Users will have access to TADS based user-profiles to specify how they want to handle the auto conference feature. These profiles can contain preferences for the user on how to handle incoming calls, or make outgoing calls based on specific rules. User-profiles are mobile. When users move from location to location, they can decide to bring all or part of their profile to the new location. For example, users might want to have in their user-profile settings for home, business, travel, etc. The user-profile, combined with the auto conference feature, can set rules for call handling depending on phone/calendar situation. Some possible rules may be: do not disturb; call forwarding; automatic message response; priority based interrupt.

Sample uses of the rules are now discussed. For example, the "Do Not Disturb" rule is used when a user is already in a conference call, or at any time in the day when they need privacy. By using the "Do Not Disturb" rule, the user can set this rule so that incoming calls and messages go directly to voice mail. "Call Forwarding" could be set so that at specific times in the day calls are automatically forwarded to different numbers. For example, in a work sharing situation, two employees may set call forwarding to automatically forward calls to each other during each other's lunch hour. "Automatic Message Response" allows for a particular message to be sent back to callers at particular times. For example, if a user's schedule indicates that the user will be out of the office for 2 hours at the time of receipt of a call, there could be an automatic message response asking the caller to leave a message and informing the caller that the message will be received in 2 hours. "Priority Based Interrupt" is a rule that can be set to allow phone calls to interrupt any other calls. For example, one could set a priority based interrupt to receive notification of all calls from a child's school, even in the middle of a meeting, overriding the "do not disturb" rules.

Figure 30 shows (via arrows as indicated below) the sequence of events associated with the auto-conference call phone synchronization solution in accordance with an embodiment of the present invention. This method requires synchronization of IP phone **101** with a TADS enabled personal computer or workgroup server **108** based calendar application. It also requires having a thin calendar based application **3002** running on IP phone **101**. User A **1801** schedules a meeting (arrow **3005**) via TADS server **108** calendar application. The calendar application in turn creates a conference call meeting profile and sends the profile to TA distribution engine **1413** (arrow **3006**). This profile will contain the contact information (e.g., phone numbers) for all the conference participants as well as other conference-related properties such as a set of instructions which are to be followed upon profile activation. TA distribution engine **1413** sends the profile to TA distribution engine **1413** (arrow **3006**) which in turn sends the profile to the phone A calendar application **3002** (arrow **3007**), which in turn saves the profile to installed application database **1302** (arrow **3008**) and will assign an ID to it. The meeting profiles

are considered TA as they will be executed at a particular time by TA execution engine **1411**. At the time of the conference call meeting, IP phone **101** will load this profile and call TA execution engine **1411** in order execute the profile (arrow **2809**). Once IP phone **101** starts executing the profile, TA execution engine **1411** will instruct IP phone **101** to generate a conference call to the pertinent participants (arrow **3010**). At this point, phone A **101** proceeds to invite phone B **116** and phone C **117** to enter the conference.

The auto-conference call phone subscription method requires the installation of a plug-in application on a TADS enabled personal computer or workgroup server **108** based calendar application. This plug-in will have access through user management module **1409** to the user profiles which would be stored on the consumers database **108**. The user profiles will be used to determine the call processing preferences for that user as defined previously. The profiles will be sent by making use of the TA distribution engine **1413** as soon as the client IP phone **101** subscribes. This plug-in will also be responsible of sending Notify messages to VoIP phone **101** upon time to start a meeting. This Notify message contains a new "Auto-Conference" XML dialog which includes all the URI or contact information for the meeting participants. A new call control feature will be added to IP phone **101** which will use these Notify messages and upon parsing the content of the XML dialog, it will generate (Host) a conference to the meeting participants.

Figure 31 shows (via arrows as indicated below) the sequence of events associated with the auto-conference call phone subscription solution in accordance with an embodiment of the present invention. Phone **101** schedules a meeting via the client PC **112** (arrow **3102**) using the calendar application residing on TADS server **108**. Phone **A 101** registers with SIP server **109** (arrow **3103**) and subscribes to the auto-conference service via the calendar application on TADS server 108 (arrow **3104**). TADS server **108** sends phone A **101** the corresponding subscriber profiles (arrow **3105**). At the time of the conference call meeting, TADS server **108** notifies phone A **101** that a new conference call should be established (arrow **3106**). Phone A **101** sends an invite message to establish communication with phone B **116** via SIP server **109** (arrow **3107**), which in turn forwards the invitation to phone B **116** (arrow **3108**). Phone A **101** sends an invite message to establish communication with phone C **117** via SIP server **109** (arrow **3109**), which in turn forwards the invitation to phone B **116** (arrow **3110**).

Figure 32 shows (via arrows as indicated below) the sequence of events associated with the auto-conference call phone subscription solution in accordance with an embodiment of the present invention. Phone A **101** schedules a meeting using the calendar application residing on TADS server **108** (arrow **3201**). TADS server **108** stores the configuration profile on consumer's database **1408** and assigns an ID to it (arrow **3202**). This profile will contain the contact information (e.g., phone numbers) for all the conference participants as well as information for the SIP multi-conference unit. The profile contains a set of instructions which are to be followed upon profile activation. At the time of the conference call, the calendar application residing on TADS server **108** requests the profile from consumer's database **1408** (arrow **3203**), receives the profile (arrow **3204**) and sends it to TA Distribution Engine **1413** (arrow **3205**) which signals the TADS based SIP MCU 109 (SIP Multi-Conference Unit) that it should start a conference call (arrow **3206**). TADS based SIP MCU **109** invites phone A **101** (arrow **3207**), invites phone **B 116** (arrow **3208**), and invites phone **C 117** (arrow **3209**) to join the conference call. The advantage of this method is that it is centralized from TADS server **108**, thus the number of conference participants is not limited by the phone. This solution requires a calendar based application running on the server and that the server be configured with the information for a SIP multi-conference unit.

A service enabled by an embodiment of the present invention related to the development of enhanced usage control methods that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate the control of the usage of IP phones via user profiles that specify allowed and disallowed data and call transactions is described in association with Figures 33-34.

The enhanced methods are based on using profiles in the phone combined with information in TADS server **108** (consumer database **1408**). An administrator of TADS enabled devices can create rules for what content and calls can be sent and received in the phone. "Content" refers to content and applications served from TADS. The profiles associated with calls may include allowed lists of numbers to call, numbers to receive, forbidden numbers to call, and forbidden numbers to receive. The profiles associated with data may include allowed content to receive, allowed information sites to access, forbidden content to receive, and forbidden information sites to access. These values are stored in consumer database **1408** associated with TADS server **108**, and may be associated with distribution schedules **1410** (in cases where content/calls to be allowed/disallowed vary during the day). Profiles will be administered via a TADS Front End Console **1201** or other tools provided developed using the TADS Programmatic API **1403** to make entering or editing this information simple so that end users do not have to understand the actual format of these profile values. For example, a national, state or world map could be displayed and let users decide which area codes/city codes/country codes to allow or disallow. The front-end could also provide the ability to go thru the call/application logs to directly ADD and REMOVE numbers or applications to the appropriate lists. The lists could be added to "group" profiles (distribution groups) so that they could be easily assigned to multiple phones. For example, you can define a "building 1 phones" group which can not call anywhere in Europe, but "building 2 phones" group can. Other options may be to create distribution groups that associate all phones from one person. For example, user A might want to avoid calls from user B no matter where he is. User A may create a profile that includes user B's home phone, cellular and business phones, and user B's TADS enabled computer system and Personal Digital Assistant (PDA). In this profile, user A adds user B's phone numbers to a list that includes phone numbers that are forbidden to contact and user B's instant message ID name to a list that includes contacts that user A is forbidden to receive. The allowed and forbidden information could alternatively be stored in an external media that could be moved with the person as needed. For example, a USB drive could be used to store this information and when connected to the TADS enabled device it would add these rules. The allowed and forbidden information could alternatively be sent directly from TADS enabled device to another TADS enabled device (for example, by emailing between two TADS enabled computers). Phones or phone groups (distribution groups) can be associated with specific instructions on what to control and when. These lists are also associated with "schedules" so that the numbers allowed to call/receive (or data/application accesses) could be different at different times of the day. Some examples of how administrators may control usage include: parents who decide that specific phones should not make calls after 10 p.m.; employers may create "do not call" lists to block specific phone numbers from being called (e.g., 976 numbers, long distance calls, etc.); parents could block TADS server games and content from 6 p.m. to 6 a.m. from their children's phones; and employers can block employee's access to some TADS content that might not be appropriate for their companies.

Figure 33 shows (via arrows as indicated below) the sequence of events associated with the usage control method in connection with content distribution scenarios in accordance with an embodiment of the present invention. The usage administrator logs in to TADS Server **108** via client personal computer **112** and edits

preferences (profiles) for all phones under a specific group of interest (e.g., "home") (arrow **3301**). TADS server **108** (using the user management module **1409**, the group subscriber/unsubscriber module **1014**, and content programming module **1406**) stores the profile preferences in consumer database **1408** (arrow **3302**). Phone A **101** and phone B **116** are assigned to a distribution group using group subscription management module **1414**. The profiles are stored in consumer database **1408** with possible associations made in a distribution group schedule **1410** for rules that apply only at certain times. When phone **A 101** initiates a request for content (arrow **3303**), TADS server **108** accesses the profile information from consumer database **1408** to determine if this is an allowed transaction (arrow **3304**). Consumer database **1408** returns the profile information (arrow **3305**). If the request for content is allowed, TADS server **108** sends the content to phone A **101** (arrow **3306**). When phone B **116** initiates a request for Content (arrow **3307**), TADS server **108** accesses the profile information from consumer database **1408** to determine if this is an allowed transaction (arrow **3308**). Consumer Database **1408** returns the profile information (arrow **3309**). If the request for content is forbidden, TADS server **108** sends an error message to phone B **116** (arrow **3311**).

Figure 34 shows (via arrows as indicated below) the sequence of events associated with the usage control method in connection with call control scenarios in accordance with an embodiment of the present invention. The usage administrator logs in to TADS Server **108** via client personal computer **112** and edits preferences (profiles) for all phones under a specific group of interest (e.g., "home") (arrow **3401**). TADS server **108** (using a user management module **1409**, a group subscriber/unsubscriber module **1414**, and a content programming module **1406**) stores the profile preferences in consumer database **1408** (arrow **3402**). Phone A **101** and phone B **116** are assigned to a distribution group using group subscription management module **1414**. The profiles are stored in consumer database **1408** with possible associations made in a distribution group schedule **1410** for rules that apply only at certain times. When phone A **101** initiates a request for a call to phone B (arrow **3403**), TADS server **108** accesses the profile information from consumer database **1408** to determine if this is an allowed transaction (arrow **3404**). Consumer database **1408** returns the profile information (arrow **3405**). If the request for the call is allowed, TADS server **108** sends an allow call message to phone A **101** (arrow **3406**). Phone A **101** then invites phone B **116** for a call (peer to peer scenario) (arrow **3407**). If the profile indicates that phone B **116** cannot be called from phone A **101**, then TADS server **108** will return a forbidden call message to phone A **101** (arrow **3408**).

A service enabled by an of the present invention related to the development of enhanced user experience methods that can leverage the TADS building blocks discussed in Figures 14-15 and software platform **500** (Figure 5) to facilitate the control and distribution of content to hospitality phones is discussed in association with Figure 35.

TADS front end tool **1201**, content programming module **1406**, or 3rd party implementations using TADS programmatic API 12014033 can be used to generate content "packages" to be displayed in TADS enabled devices (e.g., IP phone **101**). These packages may have all the information to display customized content, and provide the user with controls that they can use to access content that may not be stored locally in the TADS enabled device. Hotels and content providers can create TADS enabled applications **411** (Figure 4) to help customers with various needs, such as check-in/check-out assistance and information, billing information, room service orders, concierge services and more. Through TADS enabled applications, hotel rooms can gain access to web-based feeds of news, sports, entertainment, financial and weather content for display directly to customers'

rooms. This combined with the potential of user specific TADS enabled profiles means a user can have a wealth of information and services automatically sent to their rooms. The hotel's Property Management System (PMS) Which stores information such as reservations information, check-ins and check-outs, rates, charges/billing information, guest profiles, alerts, and more, could be accessed to customize the content that is sent to phones by content programming module **1406**. TADS transaction engine **1411** would have software for content handlers/converters (applications that convert from external formats of information, e.g., PMS data, web-feeds, other web sites, to data that can be sent and understood by the TADS enabled devices.

TA Execution Engine **1403** in the TADS-enabled client will use these packages to display content and respond to user events. Content programming module **1406** can be used, in combination with a hotel's Property Management System (PMS), to schedule and show targeted content to rooms in the hotel. Packages could be assigned to room distribution groups by using the group subscription management module **1414**. Multiple rooms could be associated with different distribution groups. This would allow a hotel to have separate "packages" that could be assigned to different room "groups." Packages could be reused. For example, the same package could be sent to different hotels in the same chain, shared amongst hotels in multiple chains, or even sold in shrink-wrapped version so that smaller hotels could use as pre-packaged solutions.

If a guest has a TADS enabled profile (an entry in a TADS consumer database **1208**) they could choose to add their TADS-enabled content directly to their hotel room using TA distribution engine **1413** and product delivery engine **1415**. This allows them to access their preferred content in addition to the hotel's recommended content, thus enhancing their experience. This would require that the hotel have allowed external access to the consumer's TADS server or that the consumer provided the information via USB drive 214 (Figure 2).

Figure 35 is a flowchart of a method **3500** to define the user experience as defined by content and application distribution to TADS enables devices in accordance with an embodiment of the present invention. Referring to Figure 35, in step **3501**, the content administrator **3607** identifies local and remote content and applications for distribution packages. In step **3502**, the content administrator **3607** defines distribution groups and associates the packages. In step **3503**, the system administrator **3607** distributes the packages.

It is noted that method **3500** may include other and/or additional steps that, for clarity, are not depicted. It is further noted that method **3500** may be executed in a different order presented and that the order presented in the discussion of Figure 35 is illustrative. It is further noted that certain steps in method **3500** may be executed in a substantially simultaneous manner.

Figure 36 shows (via arrows as indicated below) the sequence of events associated with assigning content to phones. The content administrator **3607** creates content via TADS front-end console **1201** or third party console **1419** (arrow **3601**) and stores it on database repository **111** (arrow **3602**) and assigns profiles to the phone groups via group subscriber/unsubscriber module **1414** (arrow **3603**). Group subscriber/unsubscriber module **1414** reads (arrow **3603**) new content IDs from database repositories **111** and assigns content IDs to phone groups (arrow **3604**). When Phone A **101** requests content associated with its ID (arrow **3605**), TA distribution engine **109** will return the corresponding content (arrow **3606**).

Figure 37 shows (via arrows as indicated below) the sequence of events associated with updating existing content in accordance with an embodiment of the present invention. User A **3607** updates content via TADS front-end console **1201** or third party console **1419** (arrow **3701**) and stores it on database repository **111** (arrow **3702**), from which a message is generated to TA distribution engine **109** notifying of new content (arrow **3703**).

TA distribution engine **109**, in turn, sends an update notification to Phone A **101** (arrow **3705**). The updated content is then exchanged between TA distribution engine **109** and phone A **101** via content request (arrow **3705**) and content return (arrow **3706**).

Figure 38 shows (via arrows as indicated below) the sequence of events associated with handling local content requests in accordance with an embodiment of the present invention. A phone requests local content for its profile from TADS server **108** (arrow **3801**). TADS server **108** searches for cached content on local data repositories **111** (arrow **3802**) and sends the content to phone A **101** (arrow **3804**) via TADS server **108** (arrow **3803**).

Figure 39 shows (via arrows as indicated below) the sequence of events associated with handling external content requests in accordance with an embodiment of the present invention. Phone A **101** sends a request to TADS server **108** for external content (arrow **3901**). TADS server **108** first looks for a cached copy of the requested content in local storage (arrow **3902**). If there is a cached copy, the sequence would be exactly as that depicted in Figure 38. If there is not a cached copy, TADS server **108** will receive an "Error – not found" message (arrow **3903**). TADS server **108** then will request external content via the external content via the data network **102** (arrow **3904**). Once TADS server **108** receives the requested external content (arrow **3905**), it proceeds to reformat the content for the TADS-enabled device phone A **101** and store a cached copy in database repositories **111** (arrow **3906**) and return the formatted content to phone A **101** (arrow **3907**).

Figure 40 shows (via arrows as indicated below) the sequence of events associated with handling PMS interaction in a hospitality setting in accordance with an embodiment of the present invention. Phone A **101** sends a request (arrow **4001**) for PMS information (e.g., billing information) to TADS server **108** (arrow **4002**) via a PMS interface provided by TA execution module **1503**. TADS server **108** searches for cached content on the local database repositories (arrow **4003**). If there is a cached copy, the sequence would be exactly as that depicted in Figure 38. If there is not a cached copy, TADS server **108** will receive an "Error – not found" message (arrow **4004**). TADS server **108** then will request content from the PMS system via data network **102** (arrow **4005**). Once TADS server **108** receives the requested external content (arrow **4006**), it proceeds to reformat the content for the TADS-enabled device phone A **101** and store a cached copy in database repositories **111** (arrow **4007**) and return the formatted content to phone A **101** (arrow **4009**) via the PMS interface provided by TA execution module **1303** (arrow **4008**).

Figure 41 shows (via arrows as indicated below) the sequence of events associated with handling PMS interaction in a hospitality setting in accordance with an embodiment of the present invention when it is the PMS that initiates a request for the update of PMS information on a phone (e.g., update the guest name in a room). The PMS system makes a request to TADS server **108** via the data network **102** to update PMS information associated with Phone A **101** (arrow **4101**). TADS server **108** converts the PMS-related content to a form suitable for phone A **101** and stores it on database repositories **111** (arrow **4102**) and sends the updated and formatted content to the PMS interface provided by TA execution module **1503** (arrow **4103**), which in turn sends the content to phone A **101** for display (arrow **4104**).

An embodiment of the present invention is a framework for software module deployment, update and configuration (in reference to Figure 11). A Transactional Application (TA) can be thought of as a software module. Such a framework will be hosted by the Applications and TADS server **108** and will work in conjunction with the Deployment and Configuration Services software on IP phone **101** to maintain individual software

modules up to date and with the proper configuration. The Deployment and Configuration Services are part of Other Services **502**. Deployment of software to an IP Phone **101** can be based on demographics taken from the Demographics Module **1007** or by selections of groups of IP Phones **101** made by a maintenance technician. Once a phone is selected as a software deployment candidate, communication is started between the TADS Server **1000** and the IP Phone **101** to complete the deployment, update and/or configuration operation. Communication is based on HTTP messages which contain XML data in its body. The format of this data is part of the TADS Protocol Family **1000** (discussed in association with Figure 10 below).

Figure 42 presents the message exchange between the A TADS Server **108** and the IP phone **101** during a software deployment and update operation **4200**. An optional DEPLOY message **4201** can be sent by the Applications and TADS Server **108** to trigger the operation. IP phone will respond with an OK message **4202**. IP Phone **101** will initiate the deployment and update procedure sending a REQUEST_INFO message **4203** to the Applications and TADS Server **108**. This message includes information on the current version of the hardware and software (per module) available to software modules on IP Phone **101** and the module interdependency information to be used to decide what modules can be updated.

The Applications and TADS Server will respond with a RESPONSE_DEPLOY_INFO message **4204** to indicate any available updates for independent software modules and the dependencies with other modules. An example of the contents of this message follows: Multiple FTP sessions exchanging FTP messages **4205**, **4206**, **4207** and **4208** can be established with the Applications and TADS Server **108** or a Vendor Server **118** to download individual software modules to IP Phone **101**. Messages SEND_DATA **4209** and START_UPDATE **4210** are optionally exchanged between the Applications and TADS Server **108** and IP Phone **101** to backup configuration data.

Figure 43 presents the message exchange between the Applications and TADS Server **108** and an IP Phone **101**, during a software configuration operation **4300**. Applications and TADS Server **108** can optionally send a CONFIGURE message **4301** to trigger a configuration procedure. IP Phone **101** will send OK message **4302** in response to the CONFIGURE message **4301**. IP Phone will in turn send a REQUEST_INFO message **4303** to Applications and TADS Server **108** requesting configuration information. Applications and TADS Server **108** will respond with a RESPONSE_CONFIGURE_INFO message **4304**, containing any new or different configuration information for independent software modules.

Although the method, computer program product and system are described in connection with several embodiments, it is not intended to be limited to the specific forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications and equivalents, as can be reasonably included within the spirit and scope of the invention as defined by the appended claims.

WHAT IS CLAIMED IS:

1. A method for identifying phone numbers that did not contact intended recipients made by a user of an Internet Protocol (IP) phone comprising the steps of:

sending an error message to said IP phone by a server indicating a dialed phone number made by said user of said IP phone failed to connect;

receiving an alarm message from said IP phone indicating a phone number that did not contact an intended recipient;

incrementing a failure count for said phone number that did not contact said intended recipient; and

flagging said phone number that did not contact said intended recipient if said failure count exceeds a threshold.

2. The method as recited in claim 1 further comprising the steps of:

displaying an indication of a failed telephone call by said IP phone; and

triggering said alarm message to be sent to said server.

3. The method as recited in claim 1 further comprising the step of:

launching an investigation to determine why said failure count associated with said phone number that did not contact said intended recipient exceeded said threshold.

4. The method as recited in claim 1, wherein said alarm message is generated by said IP phone automatically in response to receiving said error message.

5. A method for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone comprising the steps of:

sending an error message to said IP phone by a server indicating a directory search performed by said user of said IP phone failed to identify said contact with a phone number;

receiving an alarm message from said IP phone indicating an improper graphic;

incrementing a failure count for said searched contact; and

flagging said directory search if said failure count exceeds a threshold.

6. A computer program product embodied in a machine readable medium for identifying phone numbers made by a user of an Internet Protocol (IP) phone that did not contact intended recipients comprising the programming steps of:

sending an error message to said IP phone indicating a dialed phone number made by said user of said IP phone failed to connect;

receiving an alarm message from said IP phone indicating a phone number that did not contact an intended recipient;

incrementing a failure count for said phone number that did not contact said intended recipient; and

flagging said phone number that did not contact said intended recipient if said failure count exceeds a threshold.

7. The computer program product as recited in claim 6, wherein said alarm message is generated by said IP phone automatically in response to receiving said error message.

8. A computer program product embodied in a machine readable medium for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone comprising the programming steps of:

sending an error message to said IP phone indicating a directory search performed by said user of said IP phone failed to identify said contact with a phone number;

receiving an alarm message from said IP phone indicating an improper graphic;

incrementing a failure count for said searched contact; and

flagging said directory search if said failure count exceeds a threshold.

9. A system, comprising:

a memory unit operable for storing a computer program operable for identifying phone numbers made by a user of an Internet Protocol (IP) phone that did not contact intended recipients; and

a processor coupled to said memory unit, wherein said processor, responsive to said computer program, comprises:

circuitry for sending an error message to said IP phone indicating a dialed phone number made by said user of said IP phone failed to connect;

circuitry for receiving an alarm message from said IP phone indicating a phone number that did not contact an intended recipient;

circuitry for incrementing a failure count for said phone number that did not contact said intended recipient; and

circuitry for flagging said phone number that did not contact said intended recipient if said failure count exceeds a threshold.

10. A system, comprising:

a memory unit operable for storing a computer program operable for identifying a failed directory search of a contact performed by a user of an Internet Protocol (IP) phone; and

a processor coupled to said memory unit, wherein said processor, responsive to said computer program, comprises:

circuitry for sending an error message to said IP phone indicating a directory search performed by said user of said IP phone failed to identify said contact with a phone number;

circuitry for receiving an alarm message from said IP phone indicating an improper graphic;

circuitry for incrementing a failure count for said searched contact; and

circuitry for flagging said directory search if said failure count exceeds a threshold.

11. A method comprising the steps of:

receiving a first wakeup call to an Internet Protocol (IP) phone from a server;

receiving one or more of reminders, alerts, newspaper material and a list of information categories from said server if said first wakeup call is confirmed by a user of said IP phone; and

receiving a second wakeup call after a particular time period specified in a profile of said user if said first wakeup call is not confirmed by said user of said IP phone.

12. The method as recited in claim 11 further comprising the steps of:

automatically answering said first wakeup call if said first wakeup call is flagged as a wakeup call by said IP phone;

contacting a second server to obtain preferences of said user of said IP phone; and

connecting to said second server to transmit audio to said IP phone.

13. The method as recited in claim 12 further comprising the step of:

disconnecting said first wakeup call if said user does not confirm said first wakeup call.

14. The method as recited in claim 11 further comprising the steps of:

automatically answering said first wakeup call if said first wakeup call is flagged as a wakeup call by said IP phone;

playing an appropriate ringtone;

signaling that said user has answered said first wakeup call to said server upon said user answering said first wakeup call; and

connecting to a second server to transmit audio to said IP phone.

15. The method as recited in claim 11, wherein said one or more of said reminders, alerts, newspaper material and said list of information categories comprises a list of gift categories and a list of vendors for each gift category listed, wherein the method further comprises the steps of:

selecting a vendor from said list by said user of said IP phone;

placing an order with said vendor by said user of said IP phone; and

posting a transaction with a second server associated with said vendor.

16. The method as recited in claim 11, wherein said one or more of said reminders, alerts, newspaper material and said list of information categories comprises a list of entertainment events, wherein the method further comprises the steps of:

selecting an entertainment event from said list by said user of said IP phone;

placing an order by said user of said IP phone; and

posting a transaction with a second server associated with a vendor providing tickets to said selected entertainment event.

17. A method for contacting a merchant of an advertisement displayed on an Internet Protocol (IP) phone comprising the steps of:

receiving an advertisement on a webpage displayed on said IP phone, wherein said advertisement on said webpage includes session initiation protocol (SIP) based uniform resource identifiers (URIs);

selecting said advertisement;

passing a URI associated with said selected advertisement by a web browser of said IP phone to an application of said IP phone; and

generating a call to a merchant associated with said selected advertisement based on said URI associated with said selected advertisement by said application of said IP phone.

18. A method for generating a conference call from an Internet Protocol (IP) phone comprising the steps of:

creating a conference call meeting profile containing contact information for all conference participants in response to scheduling a meeting;

sending said conference call meeting profile to a first phone application of said IP phone, wherein said first phone application is configured to maintain a calendar of a first user of said IP phone;

executing said conference call meeting profile; and

instructing said IP phone to generate a conference call to said conference participants identified in said profile.

19. The method as recited in claim 18 further comprising the step of:

assigning an identification to said profile thereby allowing a user to have multiple defined profiles and be able to select among them.

20. A method for generating a conference call from an Internet Protocol (IP) phone comprising the steps of:

scheduling a meeting for identified conference participants by a user of said IP phone;

receiving profiles storing contact information for said identified conference participants;

receiving a notification that a conference call should be established; and

sending an invite message to each of said identified conference participants to establish communication with said IP phone.

21. A method for establishing a conference call with an Internet Protocol (IP) phone comprising the steps of:

storing a conference call meeting profile containing contact information for all conference participants, wherein said conference call meeting profile comprises a set of instructions which are to be followed upon activation of said conference call meeting profile;

receiving an indication to start a conference call associated with said conference call meeting profile;

activating said conference call meeting profile; and

inviting each of said conference participants to establish communication with said IP phone.

22. A method for controlling content distribution to and from an Internet Protocol (IP) phone comprising the steps of:

storing profile preferences of a profile in a database, wherein said profile preferences of said profile comprises rules as to which telephone calls and content are allowed to be received by a user of said IP phone and which telephone calls and content are forbidden to be received by said user of said IP phone;

associating said profile with a schedule, wherein said schedule enables different telephone calls and content to be received and forbidden at different times during the day;

receiving a request to send content to said user of said IP phone; and

determining if said user of said IP phone is allowed to receive said content based on said profile preferences of said profile.

23. The method as recited in claim 22 further comprising the step of:

sending an error message to a sender of said request to send content to said user of said IP phone if said user of said IP phone is forbidden from receiving said content.

24. The method as recited in claim 23 further comprising the step of:

assigning said sender and said user of said IP phone to a distribution group.

25. A method for controlling content distribution to and from an Internet Protocol (IP) phone comprising the steps of:

storing profile preferences of a profile in a database, wherein said profile preferences of said profile comprises rules as to which telephone calls and content are allowed to be received by a first user of an IP phone and which telephone calls and content are forbidden to be received by said first user of said IP phone;

associating said profile with a schedule, wherein said schedule enables different telephone calls and content to be received and forbidden at different times during the day;

receiving a request by a second user to telephonically connect to said first user of said IP phone; and

determining if said first user of said IP phone is allowed to telephonically connect to said second user based on said profile preferences of said profile.

26. The method as recited in claim 25 further comprising the step of:

sending a message to said second user indicating that said first user of said IP phone is forbidden from connecting telephonically with said second user if said first user of said IP phone is forbidden from connecting telephonically with said second user.

27. The method as recited in claim 27 further comprising the step of:

assigning said second user and said first user to a distribution group.

28. A method for a user to access content on an Internet Protocol (IP) phone from a hotel comprising the steps of:

generating a content package to be displayed on said IP phone, wherein said content packages comprise customized content, wherein said content package comprises one or more of the following: check-in/check-out assistance and information, billing information, room service orders, and concierge services information;

transmitting said content package to said IP phone; and

providing a user of said IP phone with controls to access content of said generated content package.

29. The method as recited in claim 28, wherein said hotel includes a system configured to customize said content package.

30. The method as recited in claim 28, wherein said content package further comprises one or more of the following: informational content and recreational content.

31. A method for facilitating the management of directory updates comprising the steps of:

generating a validation code in response to a vendor performing one or more of updating, correcting and setting up a contact information associated with a phone line of interest;

sending said validation code along with a telephone number to call to an e-mail address of said vendor;

generating one or more of an electronic mail and a facsimile; and

sending said one or more of said electronic mail and said facsimile to said vendor indicating that said phone line contact information has been successfully updated.

32. A method for assigning content to Internet Protocol (IP) phones comprising the steps of:

storing content created by an administrator on a database repository;

assigning profiles to phone groups;

reading content identifications from said database repository and assigning said read content identifications to said phone groups; and

returning content corresponding to a requested identification.

33. The method as recited in claim 32 further comprising the steps of:

storing updated content in said database repository;

generating a message notifying of said updated content;

sending said generated message to an IP phone; and

sending said updated content to said IP phone.

34. The method as recited in claim 32 further comprising the steps of:

receiving a request for local content from an IP phone;

searching for said requested local content in said database repository; and

sending said requested local content to said IP phone.

35. The method as recited in claim 32 further comprising the steps of:

receiving a request for external content from an IP phone;

requesting said requested external content via a data network;

receiving said requested external content;

reformatting said received requested external content;

storing a copy of said reformatted requested external content in said database repository; and

sending said reformatted requested external content to said IP phone.

36. The method as recited in claim 33, wherein the method for assigning content to IP phones occurs in a hospitality setting.

37. The method as recited in claim 34, wherein the method for assigning content to IP phones occurs in a hospitality setting.

38. The method as recited in claim 35, wherein the method for assigning content to IP phones occurs in a hospitality setting.

Figure 1

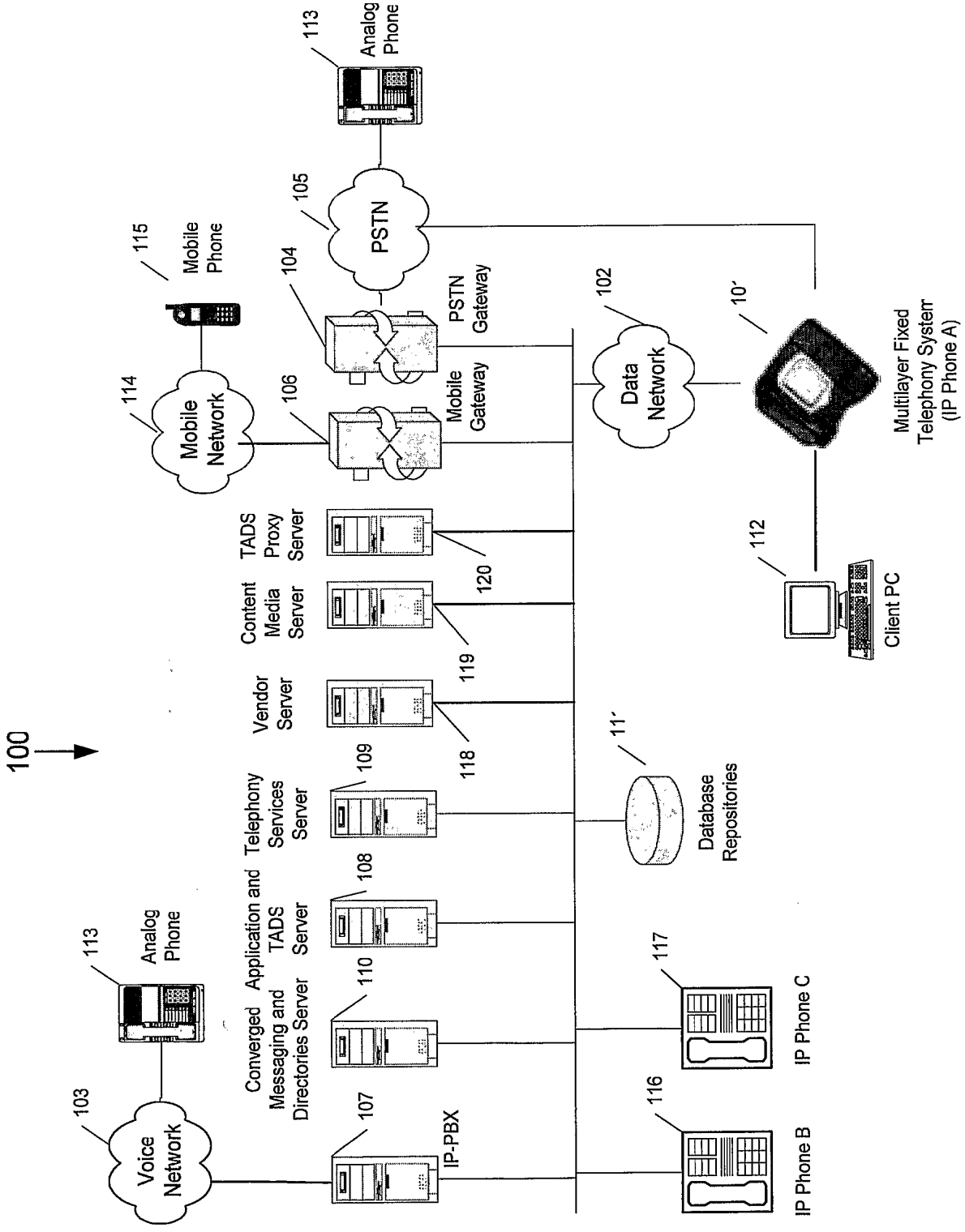

100
Voice Network
103
Analog Phone
113
Converged Messaging and Directories Server
110
Application and TADS Server
108
Telephony Services Server
109
Vendor Server
118
Content Media Server
119
TADS Proxy Server
120
IP-PBX
107
Mobile Network
114
Mobile Phone
115
Mobile Gateway
106
PSTN Gateway
104
PSTN
105
Analog Phone
113
Data Network
102
Database Repositories
11'
IP Phone B
116
IP Phone C
117
Client PC
112
Multilayer Fixed Telephony Systerr (IP Phone A)
10'

Figure 2

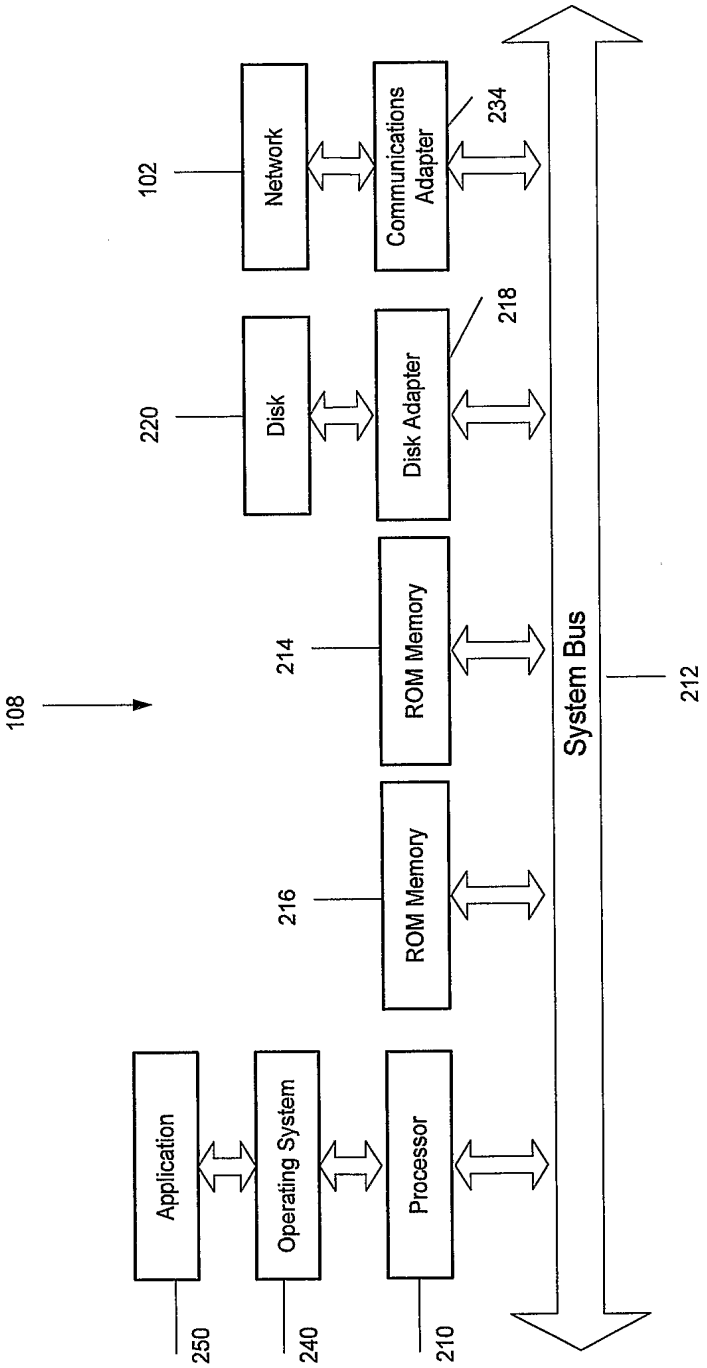

108
System Bus
212
Application
250
Operating System
240
Processor
210
ROM Memory
216
ROM Memory
214
Disk
220
Disk Adapter
218
Network
102
Communications Adapter
234

Figure 3

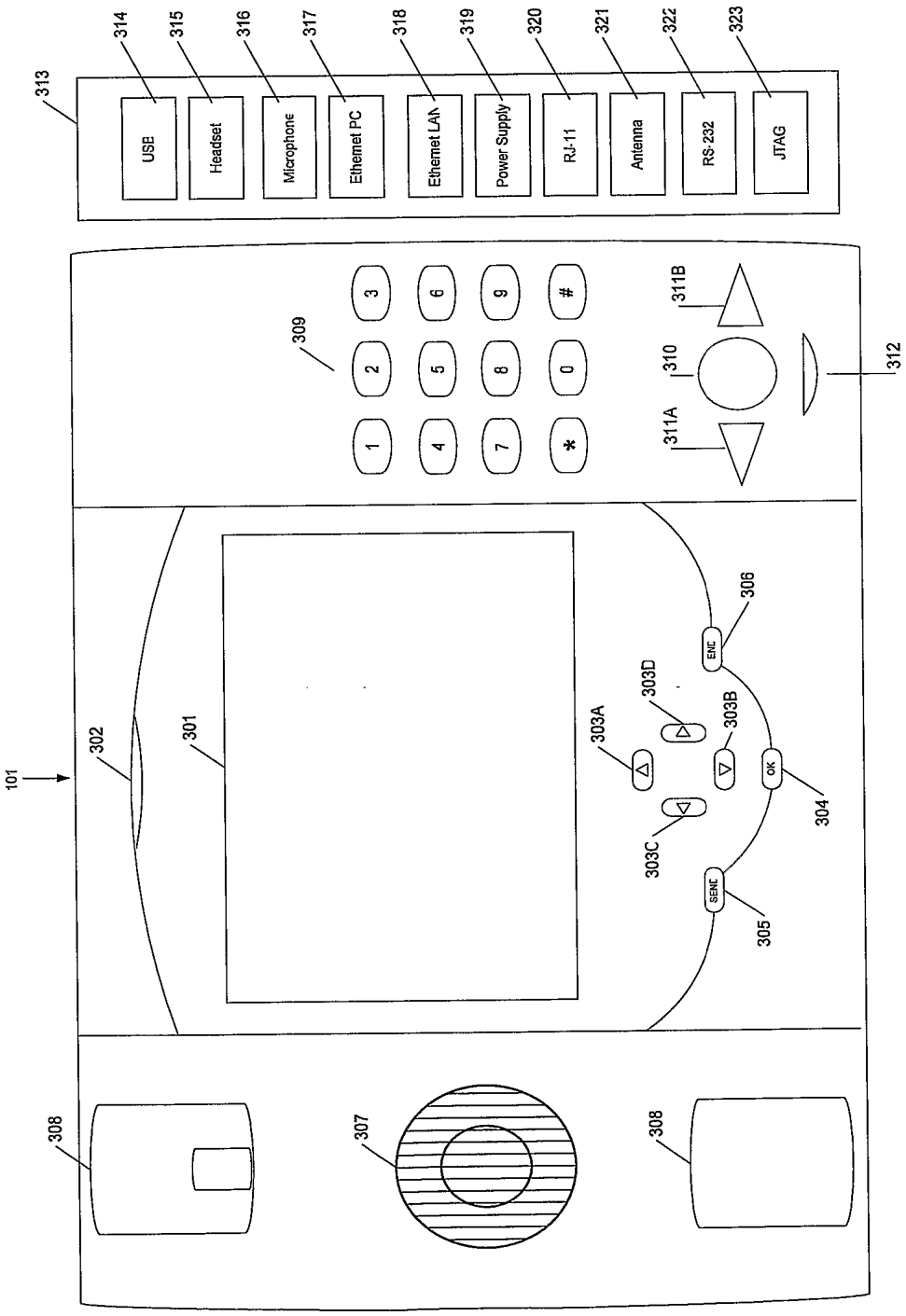

313
314
USB
315
Headset
316
Microphone
317
Ethernet PC
318
Ethernet LAN
319
Power Supply
320
RJ-11
321
Antenna
322
RS-232
323
JTAG
309
1
2
3
4
5
6
7
8
9
*
0
#
311A
310
311B
312
101
302
301
306
ENT
303D
303A
303B
OK
304
303C
SEND
305
308
307
308

Figure 4

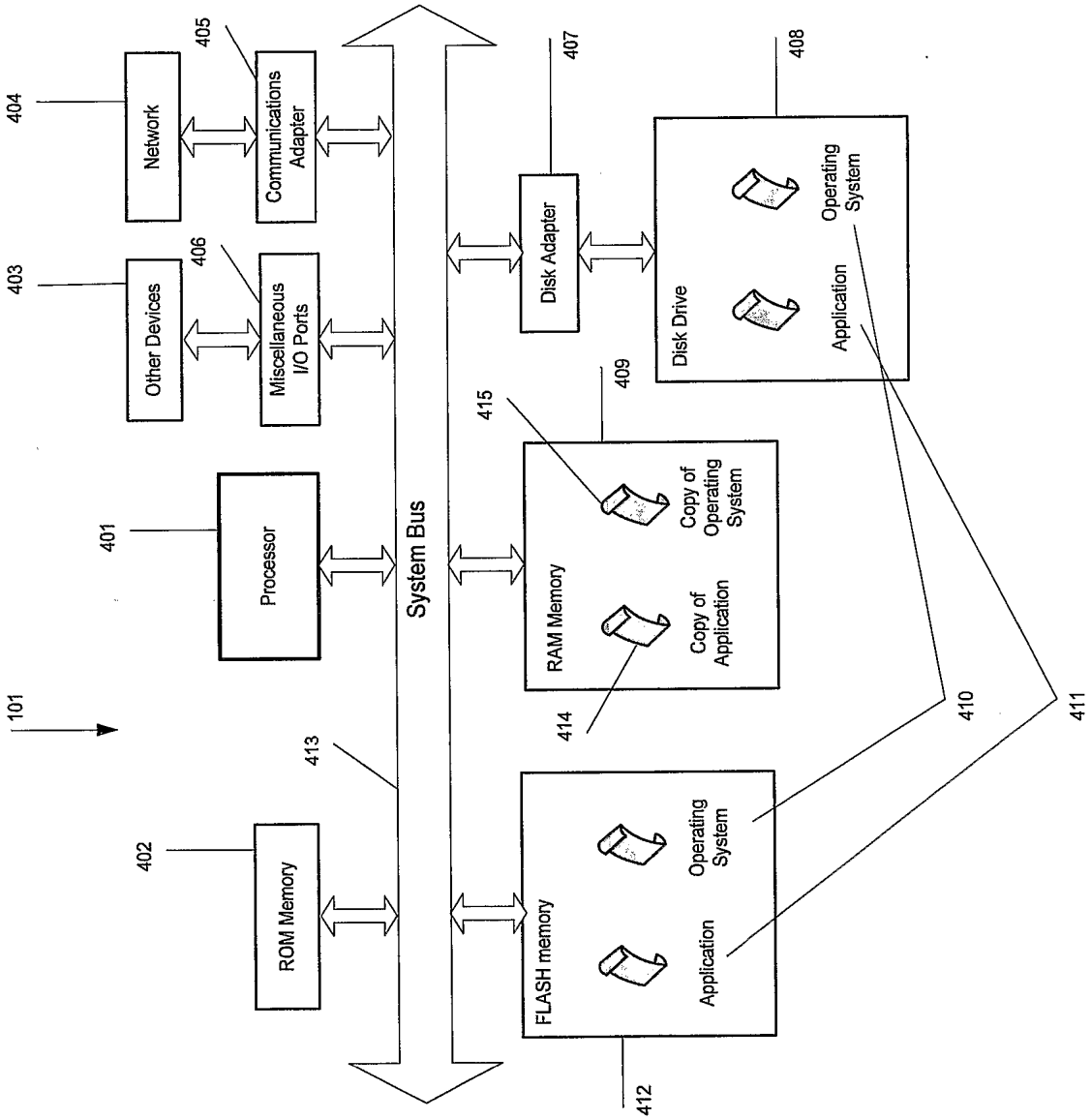

101
401
Processor
402
ROM Memory
403
Other Devices
404
Network
405
Communications Adapter
406
Miscellaneous I/O Ports
407
Disk Adapter
408
Disk Drive
Operating System
Application
409
RAM Memory
Copy of Operating System
Copy of Application
410
411
412
FLASH memory
Operating System
Application
413
System Bus
414
415

Figure 5

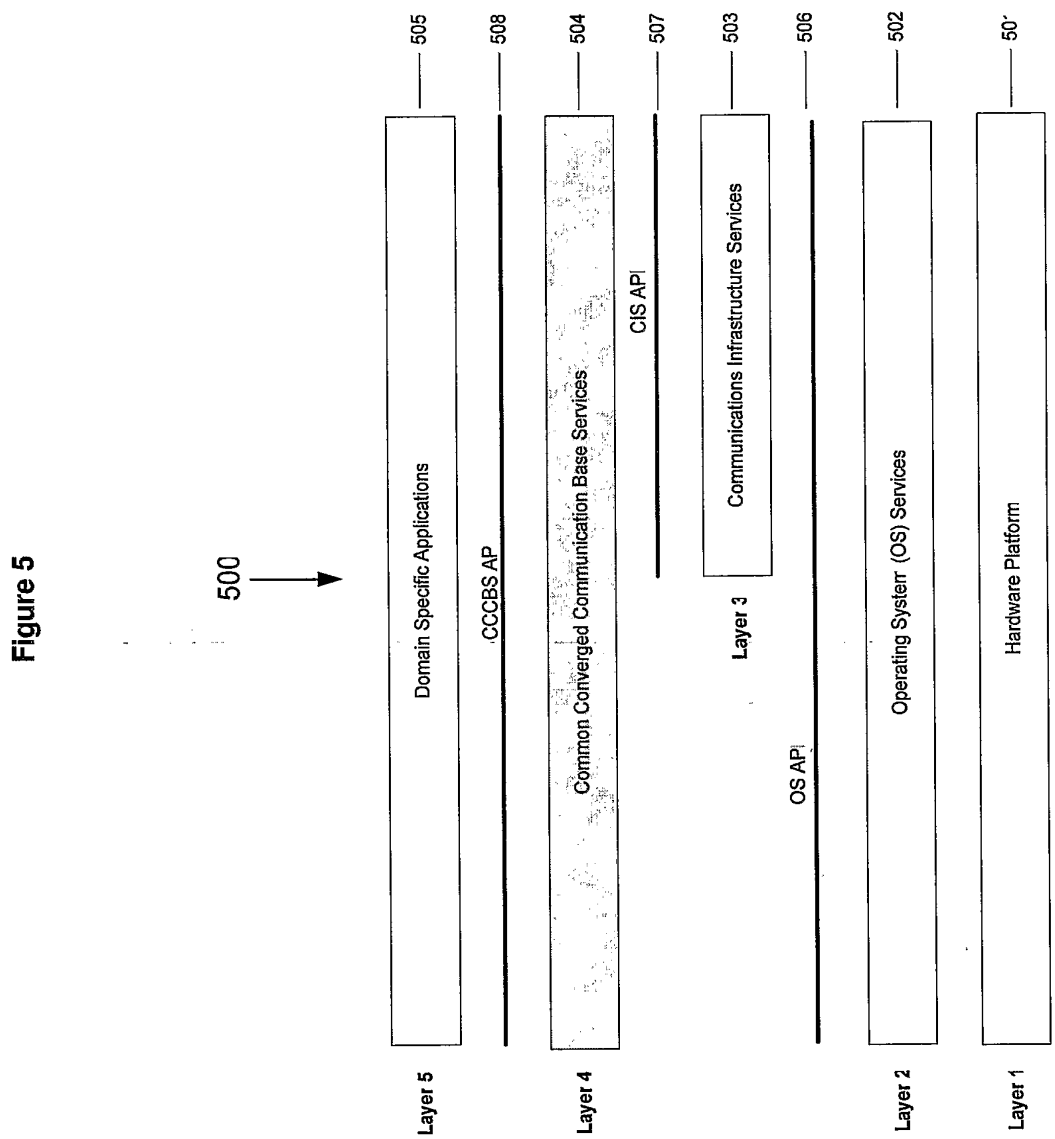

500
505
508
504
507
503
506
502
50'
Domain Specific Applications
CCCBS AP
Common Converged Communication Base Services
CIS API
Communications Infrastructure Services
OS API
Operating System (OS) Services
Hardware Platform
Layer 5
Layer 4
Layer 3
Layer 2
Layer 1

Figure 6

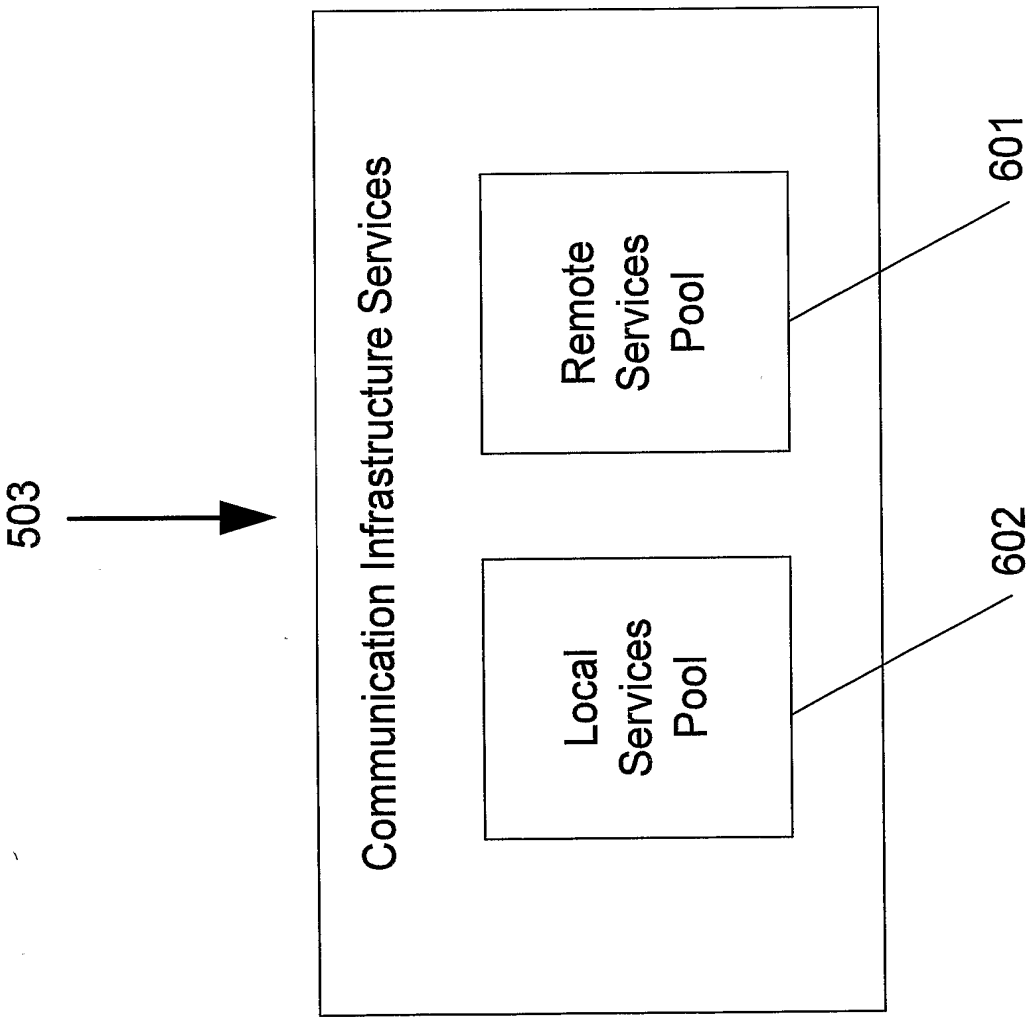

503
Communication Infrastructure Services
Remote Services Pool
Local Services Pool
601
602

Figure 7

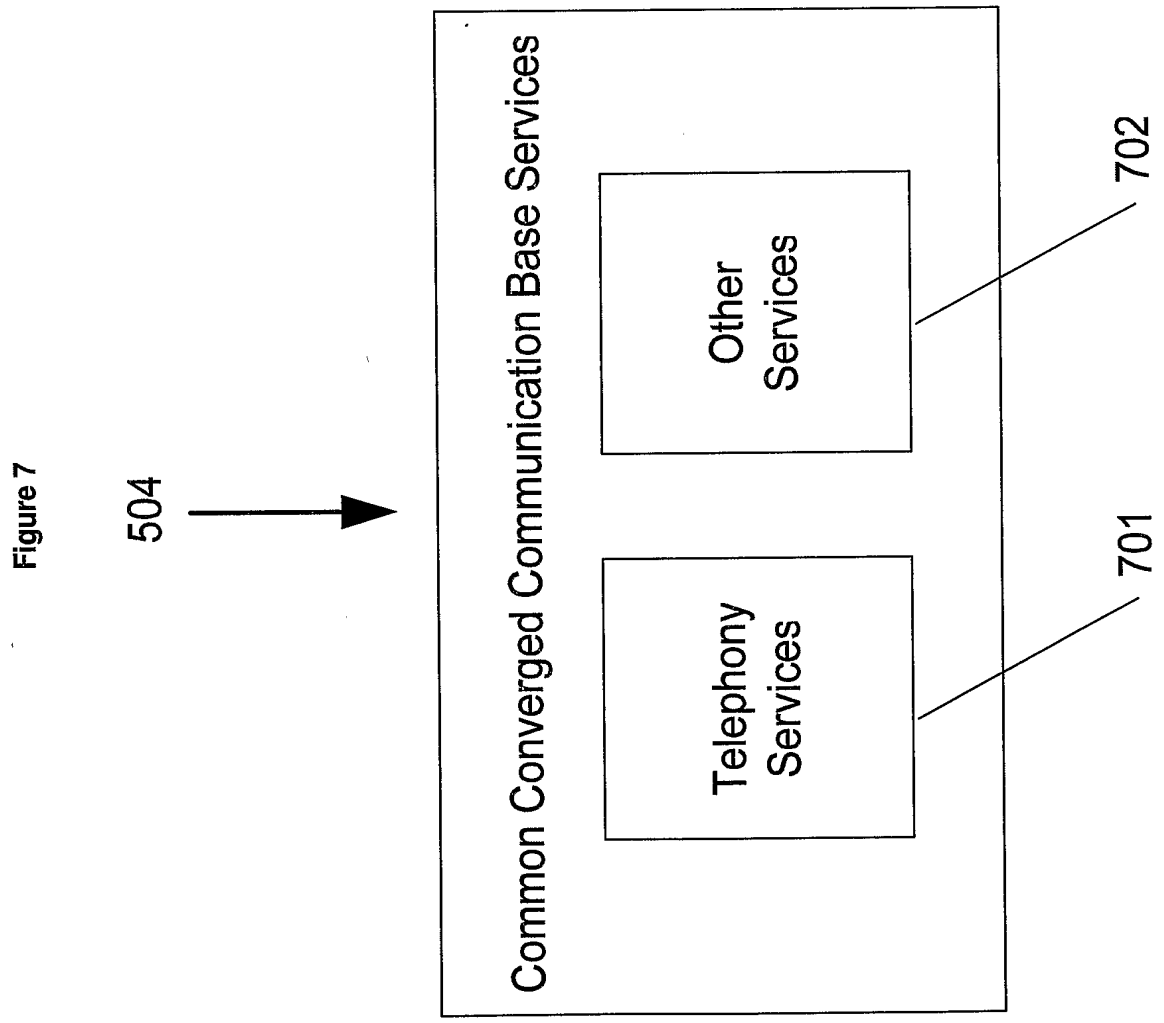

504
Common Converged Communication Base Services
Other Services
Telephony Services
702
701

Figure 8

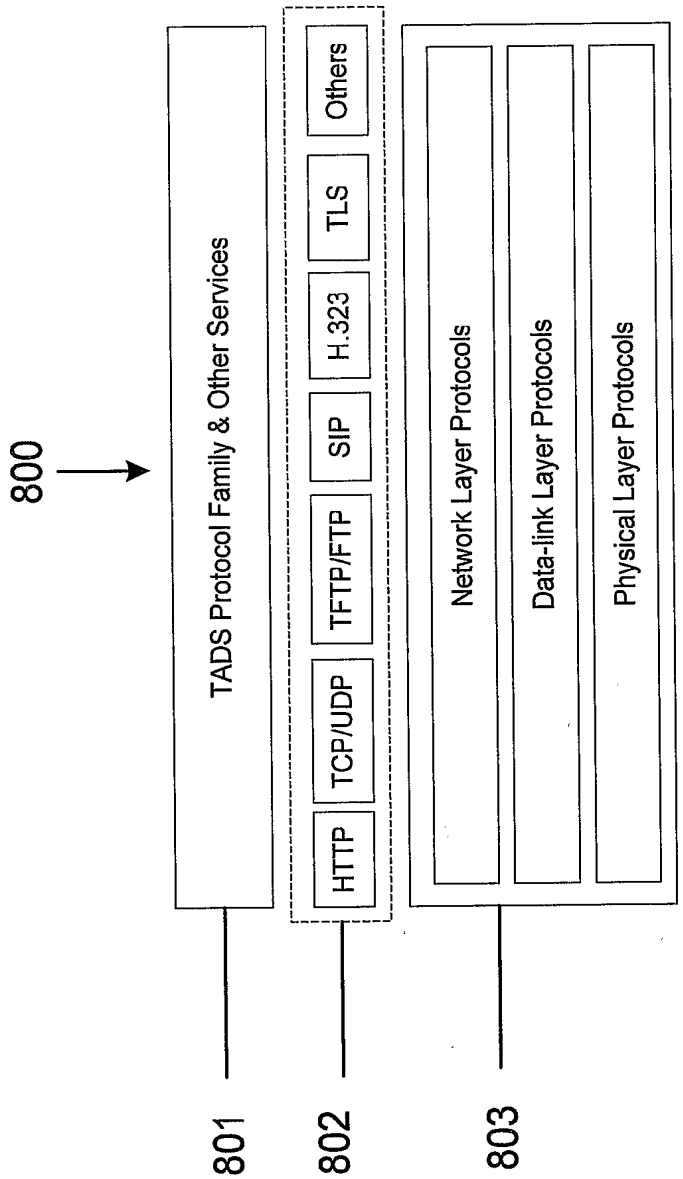

800
TADS Protocol Family & Other Services
HTTP
TCP/UDP
TFTP/FTP
SIP
H.323
TLS
Others
Network Layer Protocols
Data-link Layer Protocols
Physical Layer Protocols
801
802
803

Figure 9

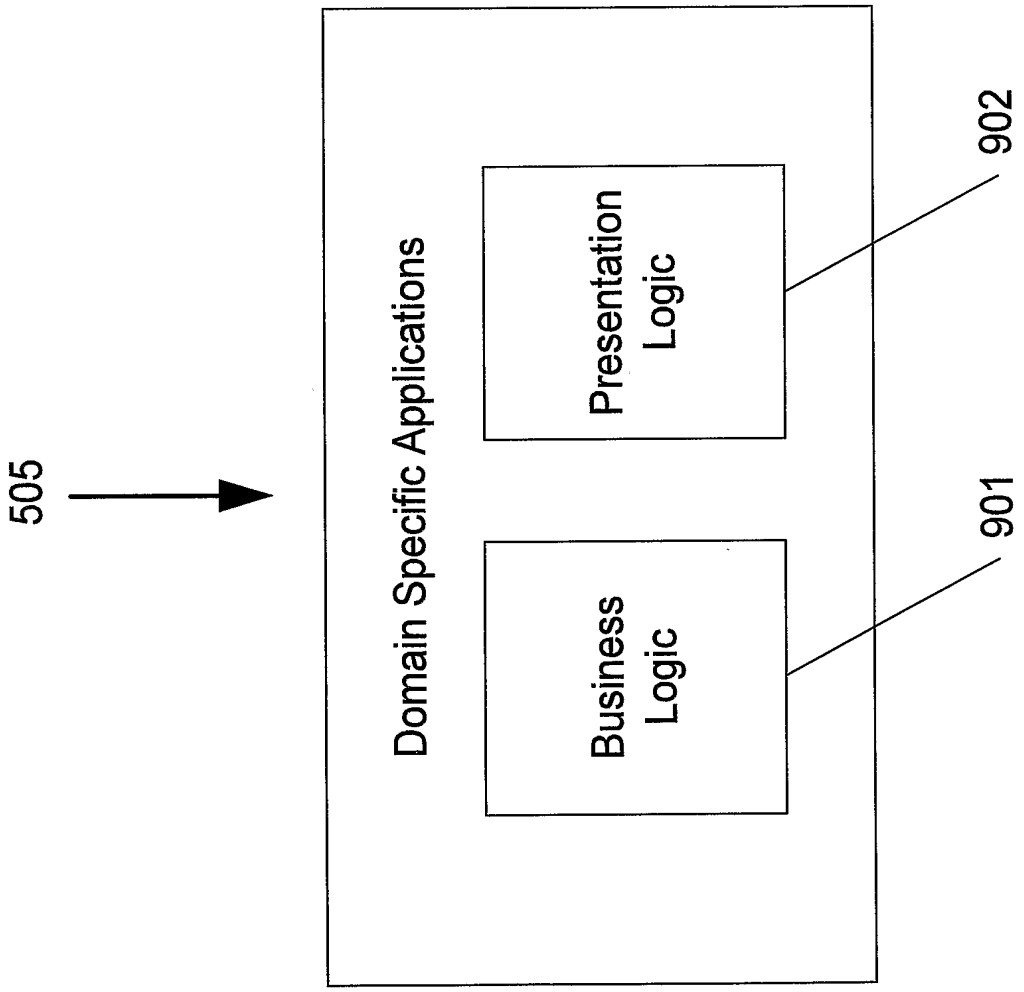

505
Domain Specific Applications
Presentation Logic
Business Logic
902
901

Figure 10

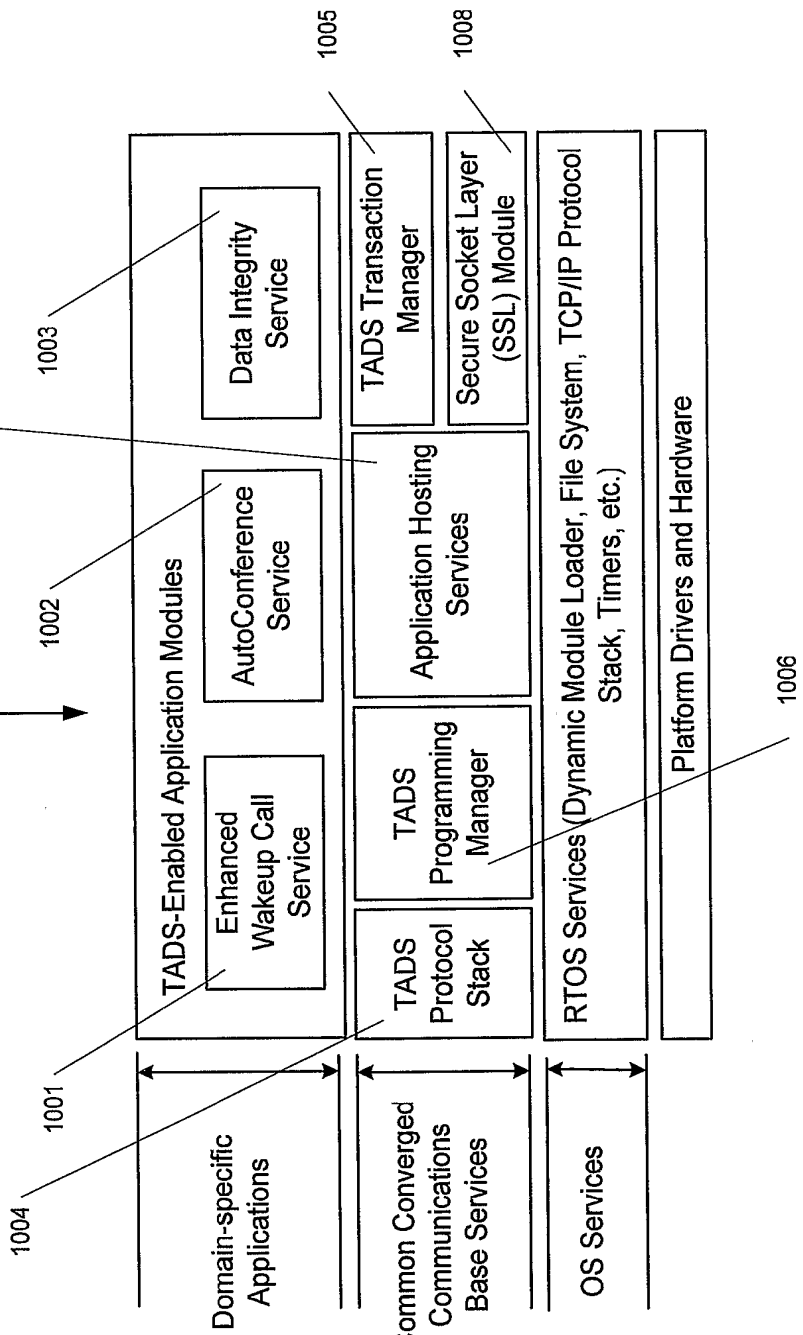

1000
1001
1002
1003
1004
1005
1006
1007
1008
Domain-specific Applications
Common Converged Communications Base Services
OS Services
TADS-Enabled Application Modules
Enhanced Wakeup Call Service
AutoConference Service
Data Integrity Service
TADS Protocol Stack
TADS Programming Manager
Application Hosting Services
TADS Transaction Manager
Secure Socket Layer (SSL) Module
RTOS Services (Dynamic Module Loader, File System, TCP/IP Protocol Stack, Timers, etc.)
Platform Drivers and Hardware

Figure 11

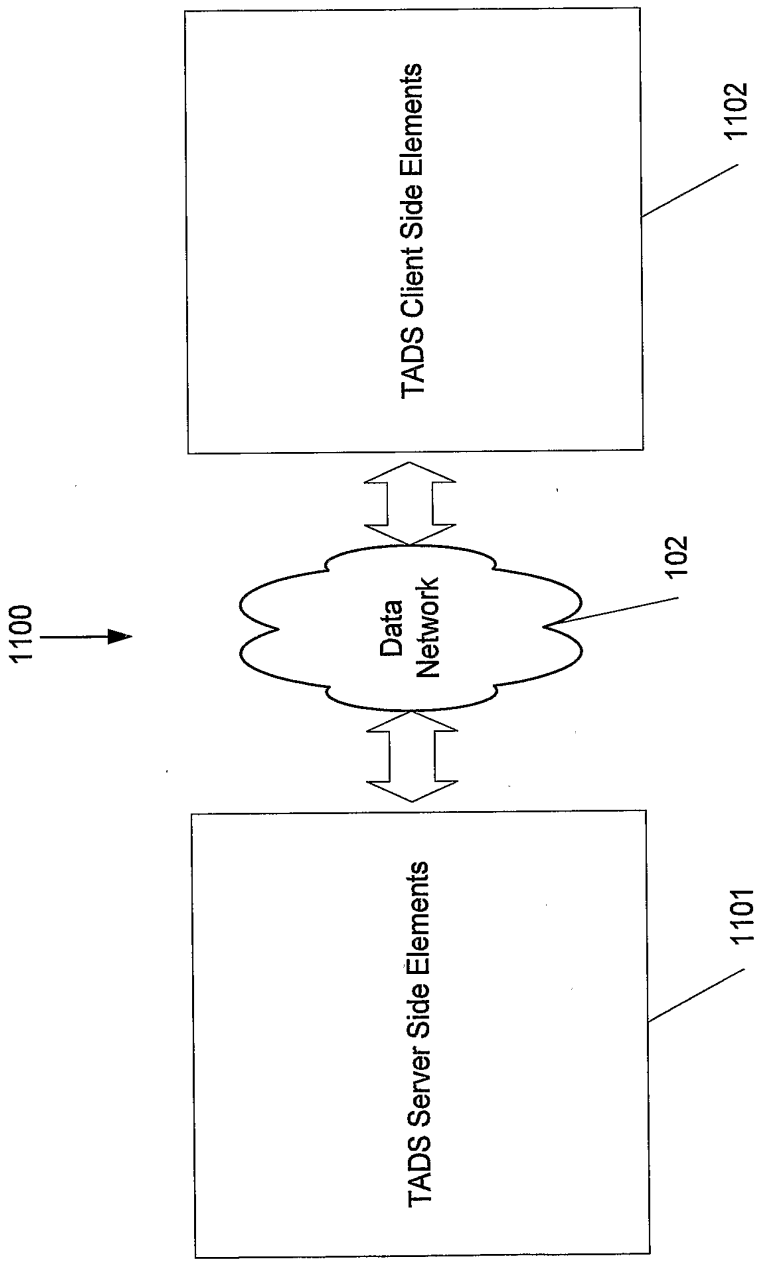

1100
TADS Client Side Elements
1102
Data Network
102
TADS Server Side Elements
1101

Figure 12

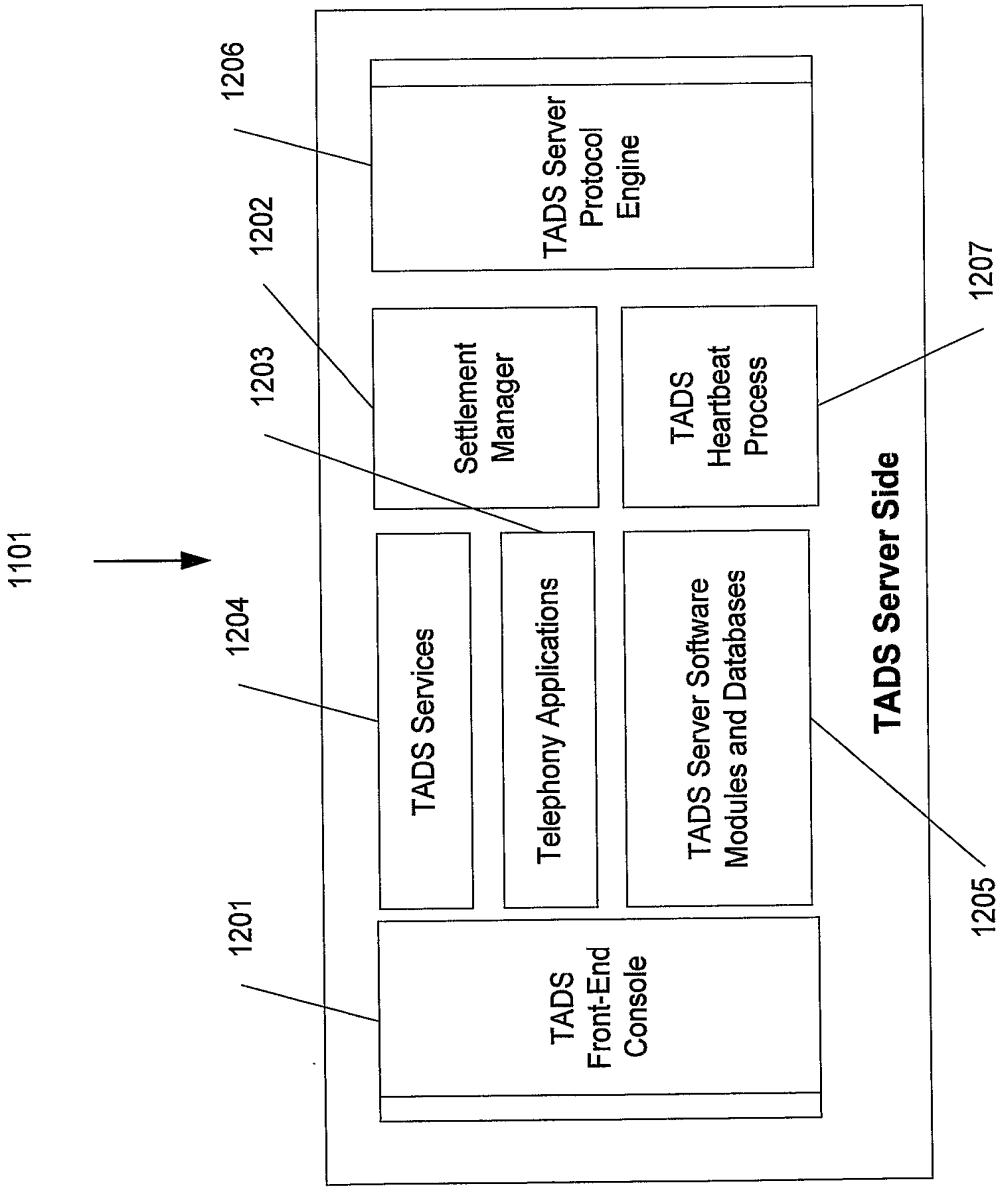

1101
1206
1202
1203
1207
1204
1201
1205
TADS Server Protocol Engine
Settlement Manager
TADS Heartbeat Process
TADS Services
Telephony Applications
TADS Server Software Modules and Databases
TADS Front-End Console
TADS Server Side

Figure 13

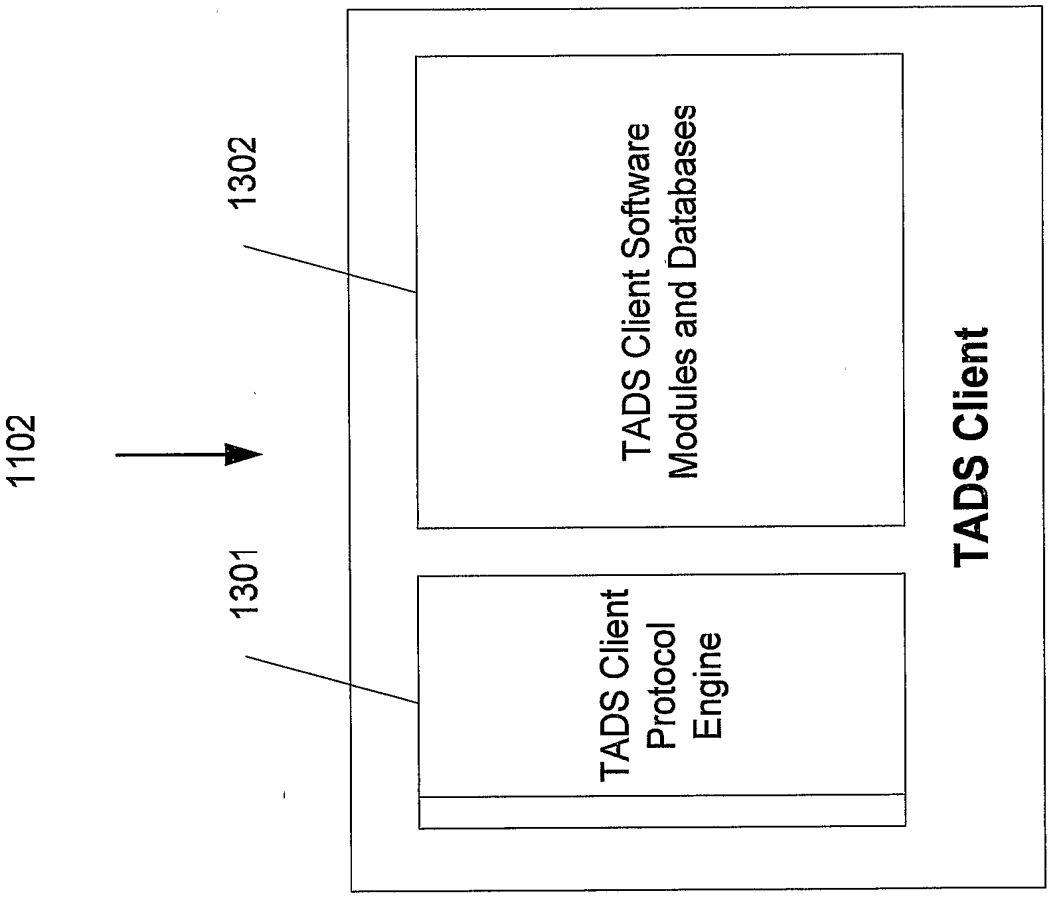

1102
1302
1301
TADS Client Software Modules and Databases
TADS Client Protocol Engine
TADS Client

Figure 14

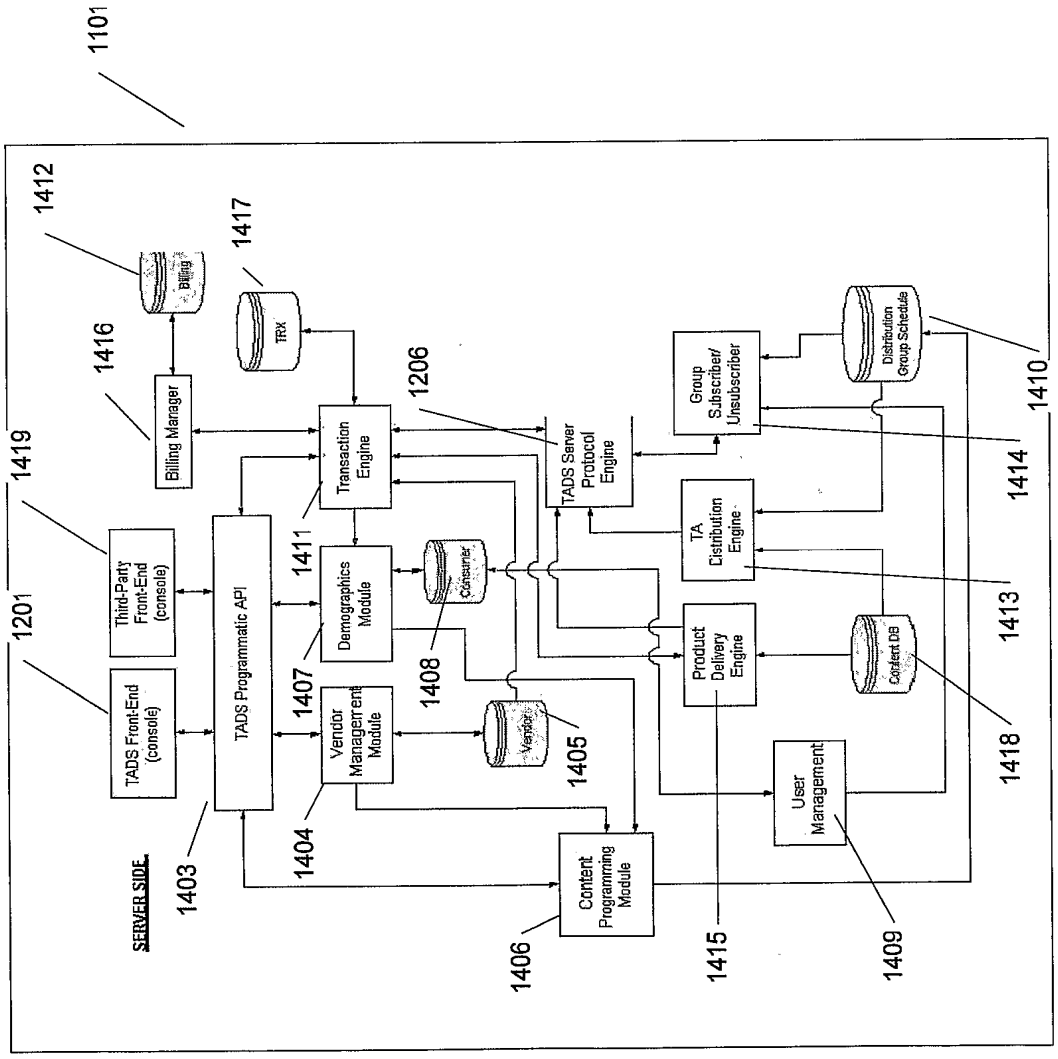

1101
1412
1417
1416
1206
1419
1414
1411
1201
1413
1407
1408
1418
1405
1404
1403
1406
1415
1409
1410
Billing
TRX
Billing Manager
Transaction Engine
TADS Server Protocol Engine
Group Subscriber/ Unsubscriber
Distribution Group Schedule
Third-Party Front-End (console)
TADS Front-End (console)
TADS Programmatic API
Demographics Module
Consumer
TA Distribution Engine
Product Delivery Engine
Content DB
Vendor Management Module
Vendor
User Management
Content Programming Module
SERVER SIDE

Figure 15

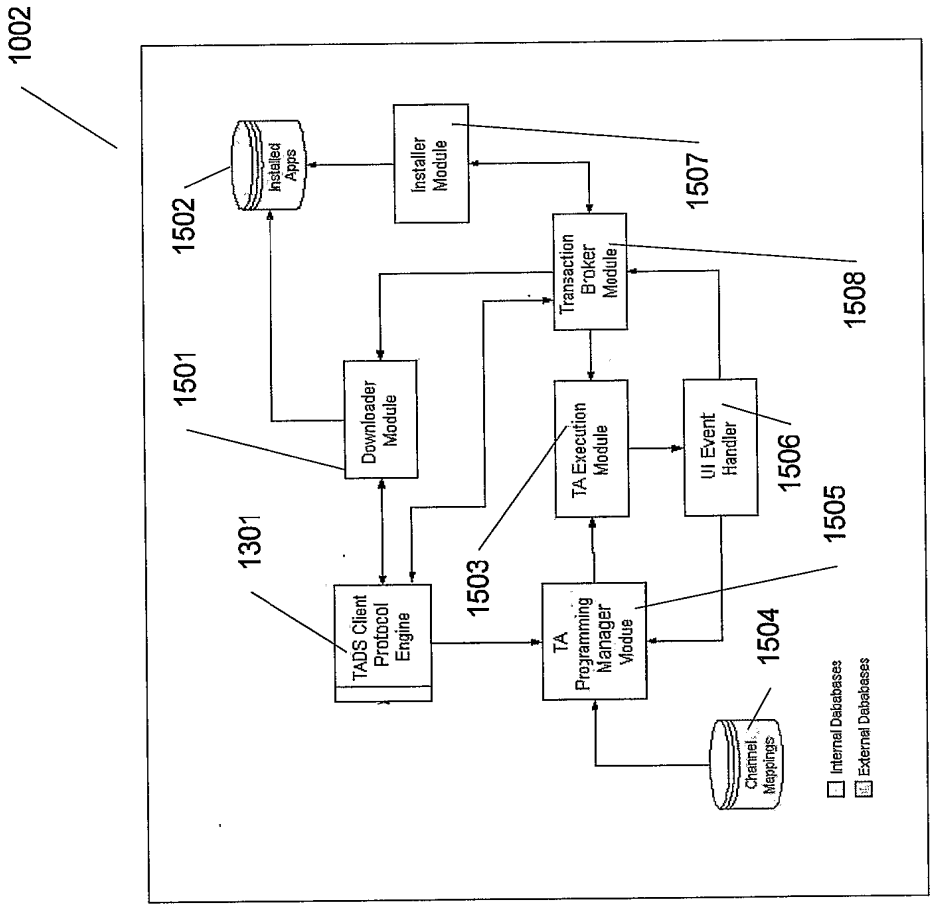

1002
Installed Apps
1502
Installer Module
1507
Transaction Broker Module
1508
1501
Downloader Module
TA Execution Module
UI Event Handler
1506
1505
1301
TADS Client Protocol Engine
1503
TA Programming Manager Module
1504
Channel Mappings
Internal Databases
External Databases

Figure 16

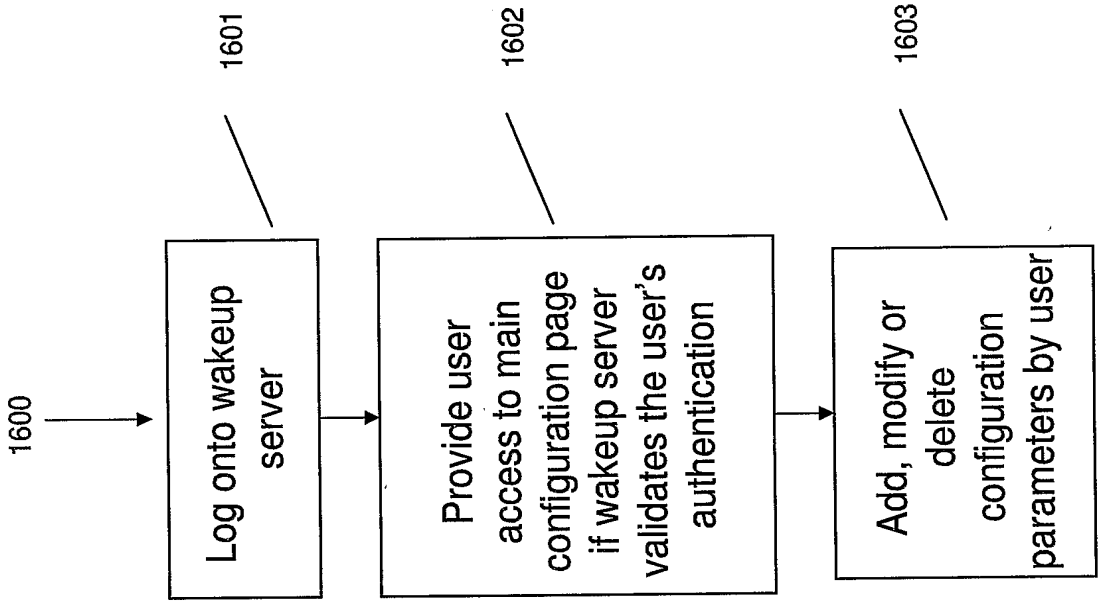

1600
1601
Log onto wakeup server
1602
Provide user access to main configuration page if wakeup server validates the user's authentication
1603
Add, modify or delete configuration parameters by user

Figure 17

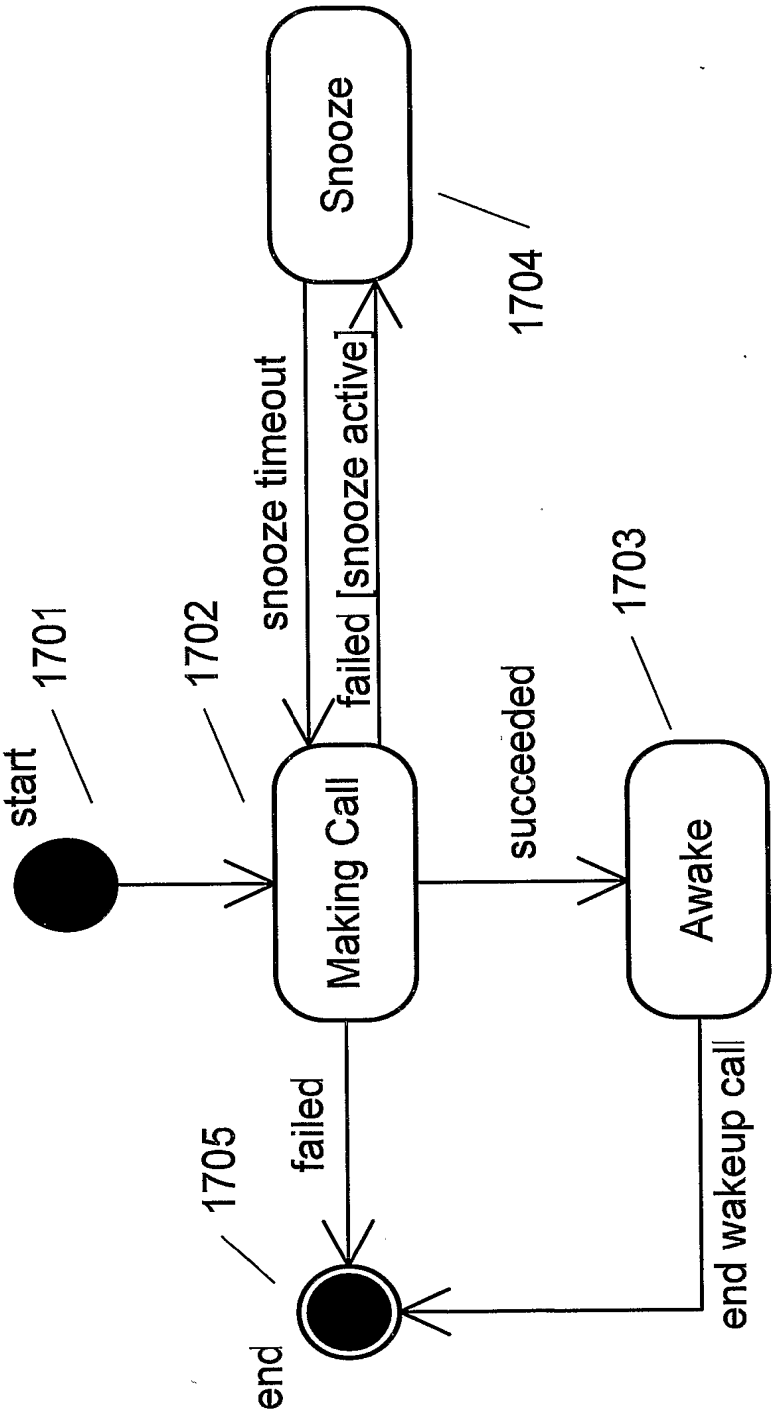

Snooze
1704
snooze timeout
failed [snooze active]
1701
start
1702
Making Call
succeeded
1703
Awake
1705
failed
end
end wakeup call

Figure 18

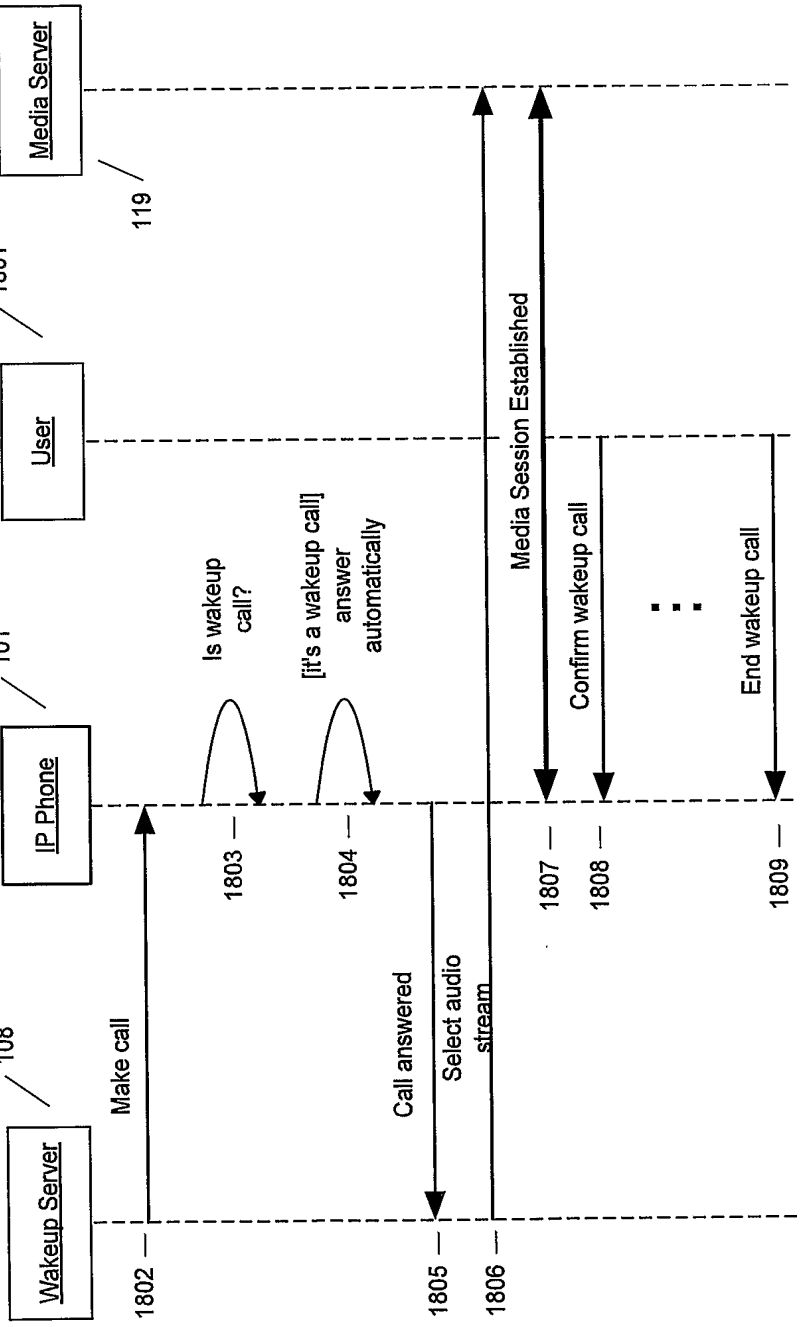

Wakeup Server
108
IP Phone
101
User
1801
Media Server
119
Make call
1802
Is wakeup call?
1803
[it's a wakeup call] answer automatically
1804
Call answered
1805
Select audio stream
1806
Media Session Established
1807
Confirm wakeup call
1808
End wakeup call
1809

Figure 19

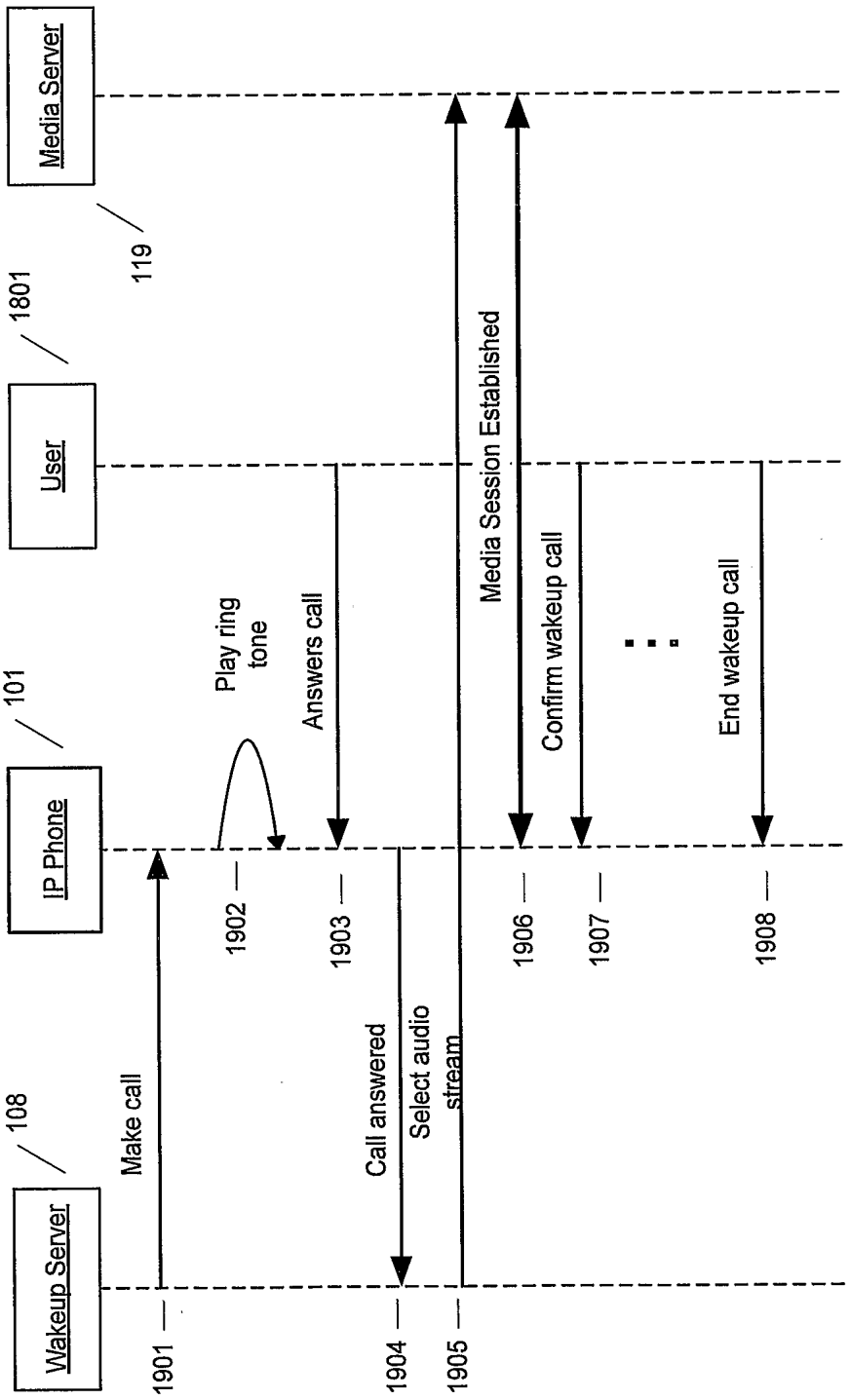

Wakeup Server
108
IP Phone
101
User
1801
Media Server
119
Make call
Play ring tone
Answers call
Call answered
Select audio stream
Media Session Established
Confirm wakeup call
End wakeup call
1901
1902
1903
1904
1905
1906
1907
1908

Figure 20

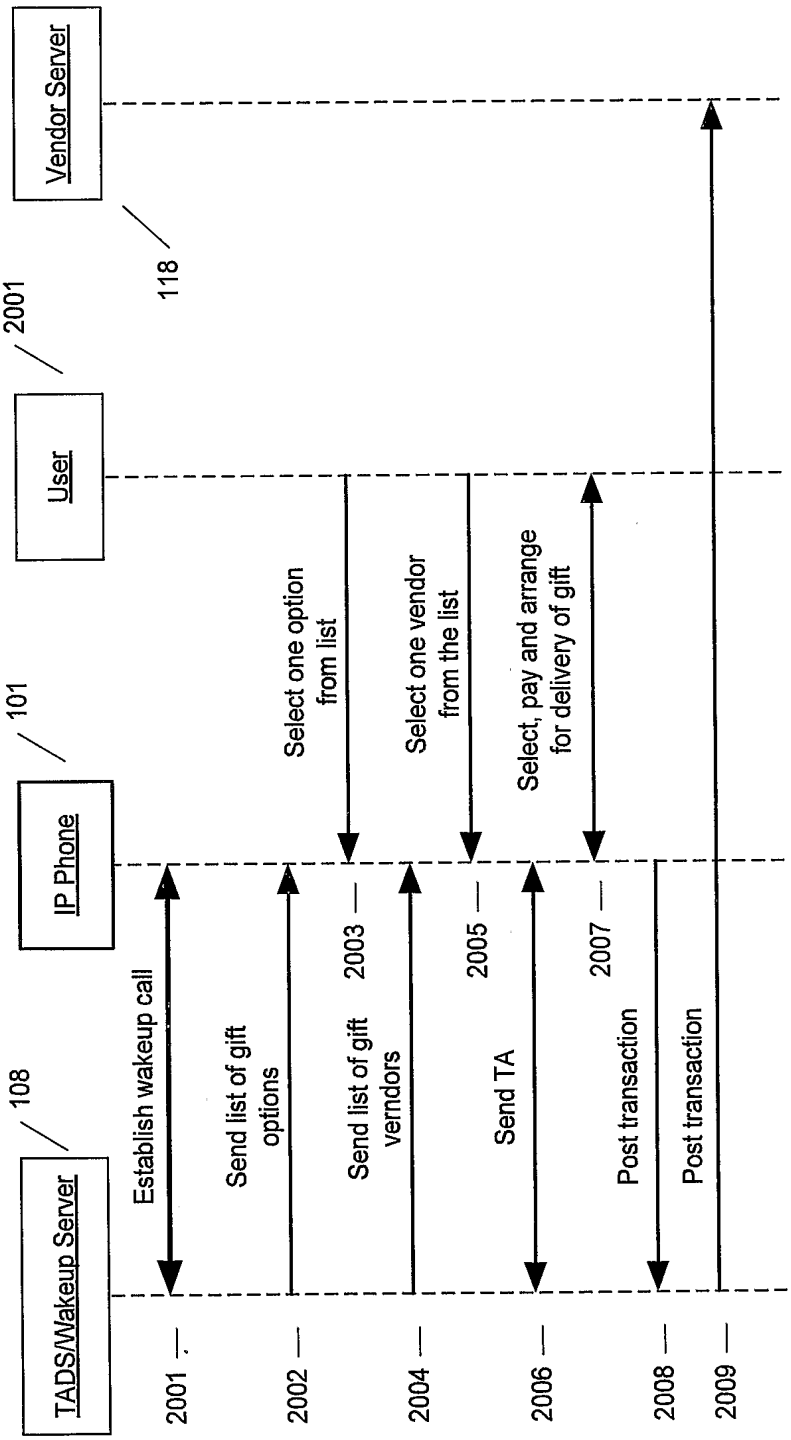

TADS/Wakeup Server
108
IP Phone
101
User
2001
Vendor Server
118
Establish wakeup call
Send list of gift options
Send list of gift verndors
2003
Send TA
2005
Post transaction
2007
Post transaction
Select one option from list
Select one vendor from the list
Select, pay and arrange for delivery of gift
2001
2002
2004
2006
2008
2009

Figure 21

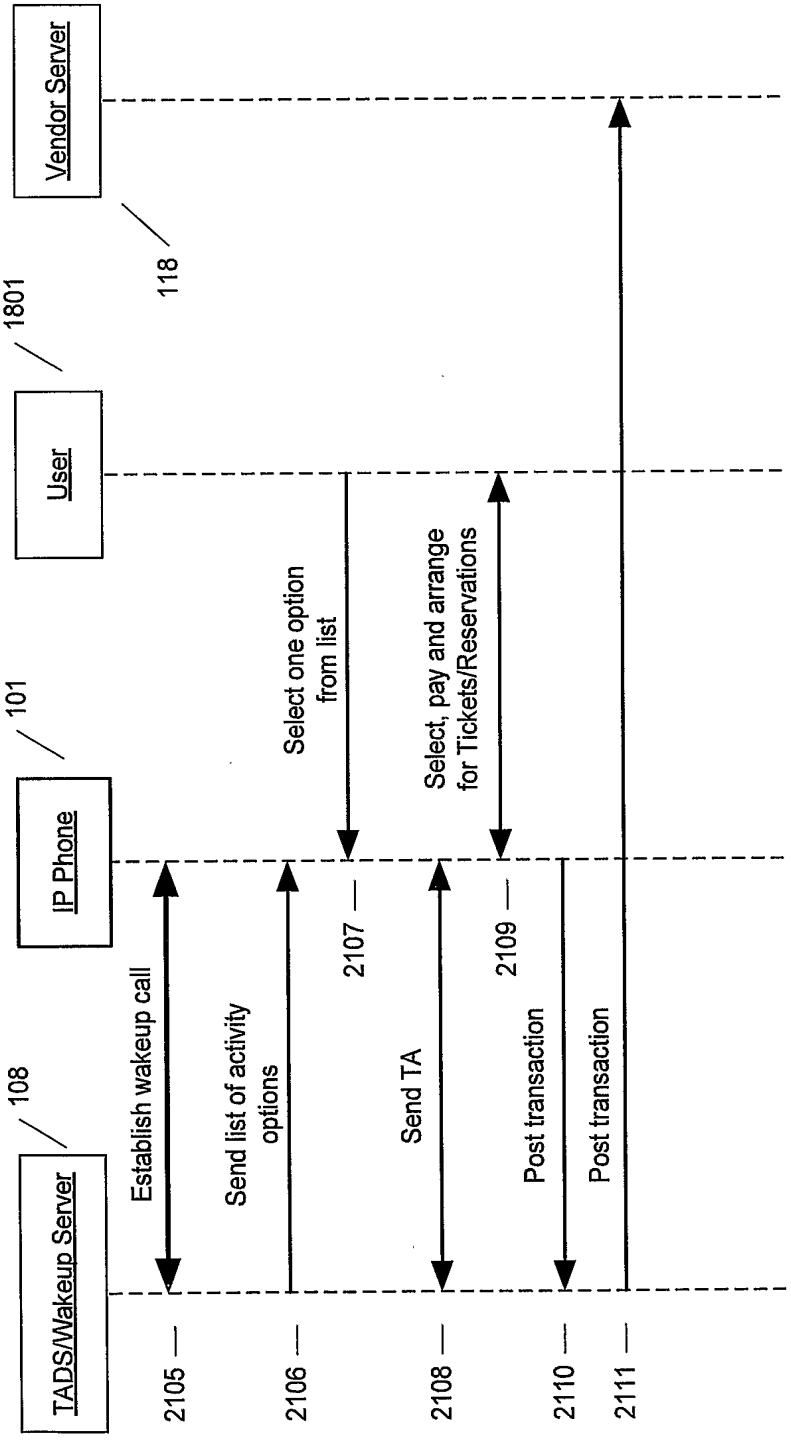

TADS/Wakeup Server
108
IP Phone
101
User
1801
Vendor Server
118
Establish wakeup call
Send list of activity options
Select one option from list
Send TA
Select, pay and arrange for Tickets/Reservations
Post transaction
Post transaction
2105
2106
2107
2108
2109
2110
2111

Figure 22

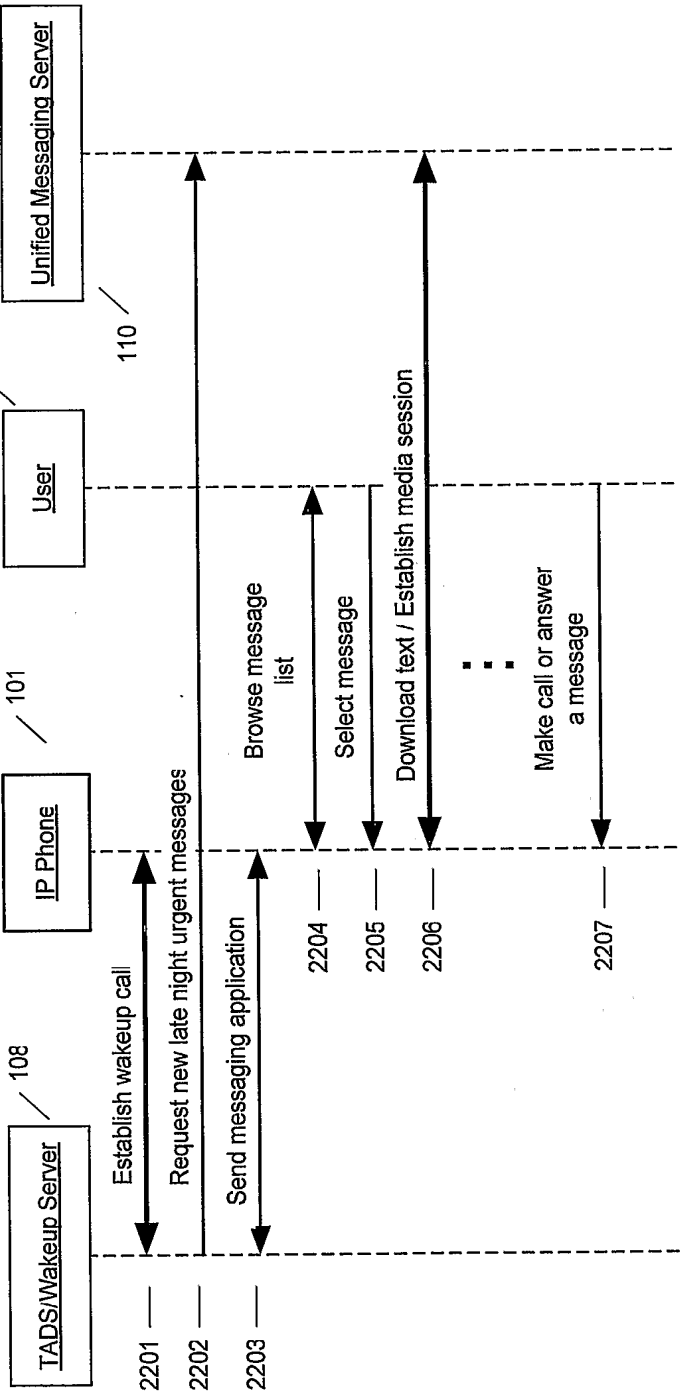

TADS/Wakeup Server
108
IP Phone
101
User
1801
Unified Messaging Server
110
Establish wakeup call
Request new late night urgent messages
Send messaging application
Browse message list
Select message
Download text / Establish media session
Make call or answer a message
2201
2202
2203
2204
2205
2206
2207

Figure 23

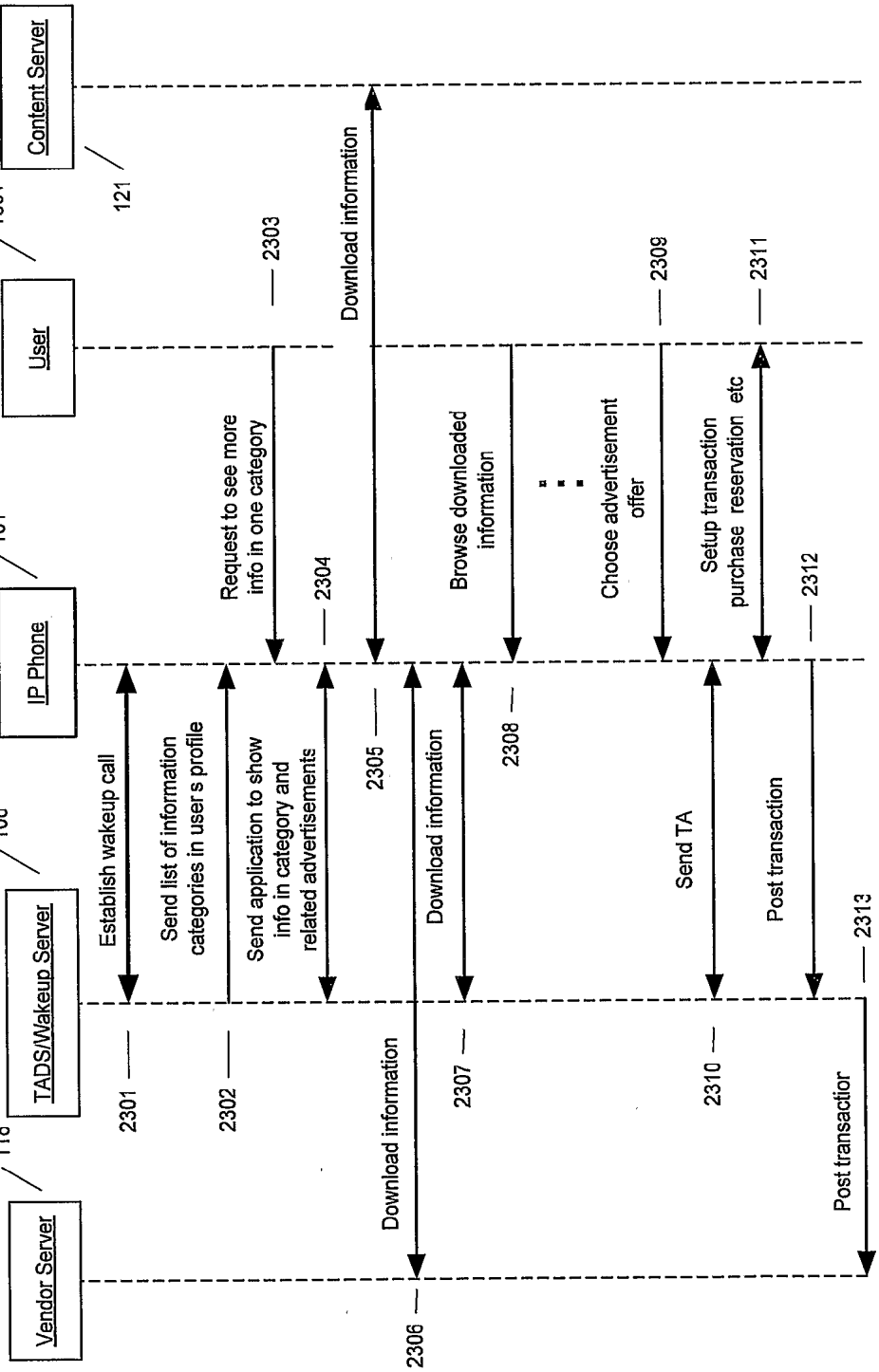

Vendor Server
118
TADS/Wakeup Server
108
IP Phone
101
User
1801
Content Server
121
Establish wakeup call
2301
Send list of information categories in user s profile
2302
Send application to show info in category and related advertisements
2304
Request to see more info in one category
2303
Download information
2305
Download information
2306
Browse downloaded information
2308
Download information
2307
Choose advertisement offer
2309
Send TA
2310
Setup transaction purchase reservation etc
2311
Post transaction
2312
Post transactior
2313

Figure 24

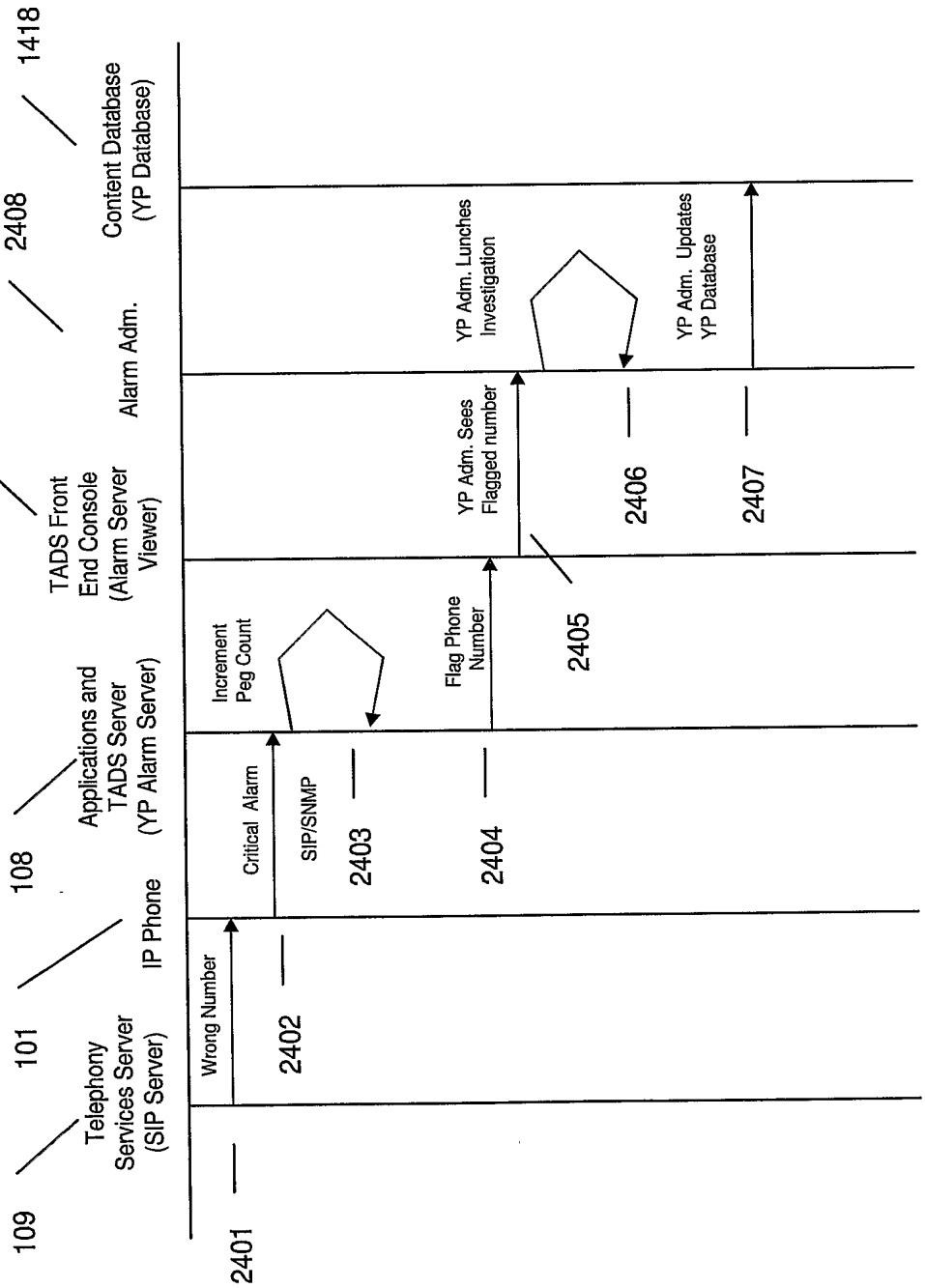

109
Telephony Services Server (SIP Server)
101
IP Phone
108
Applications and TADS Server (YP Alarm Server)
1201
TADS Front End Console (Alarm Server Viewer)
2408
Alarm Adm.
1418
Content Database (YP Database)
2401
Wrong Number
2402
Critical Alarm
SIP/SNMP
2403
Increment Peg Count
2404
Flag Phone Number
2405
YP Adm. Sees Flagged number
2406
YP Adm. Lunches Investigation
2407
YP Adm. Updates YP Database

Figure 25

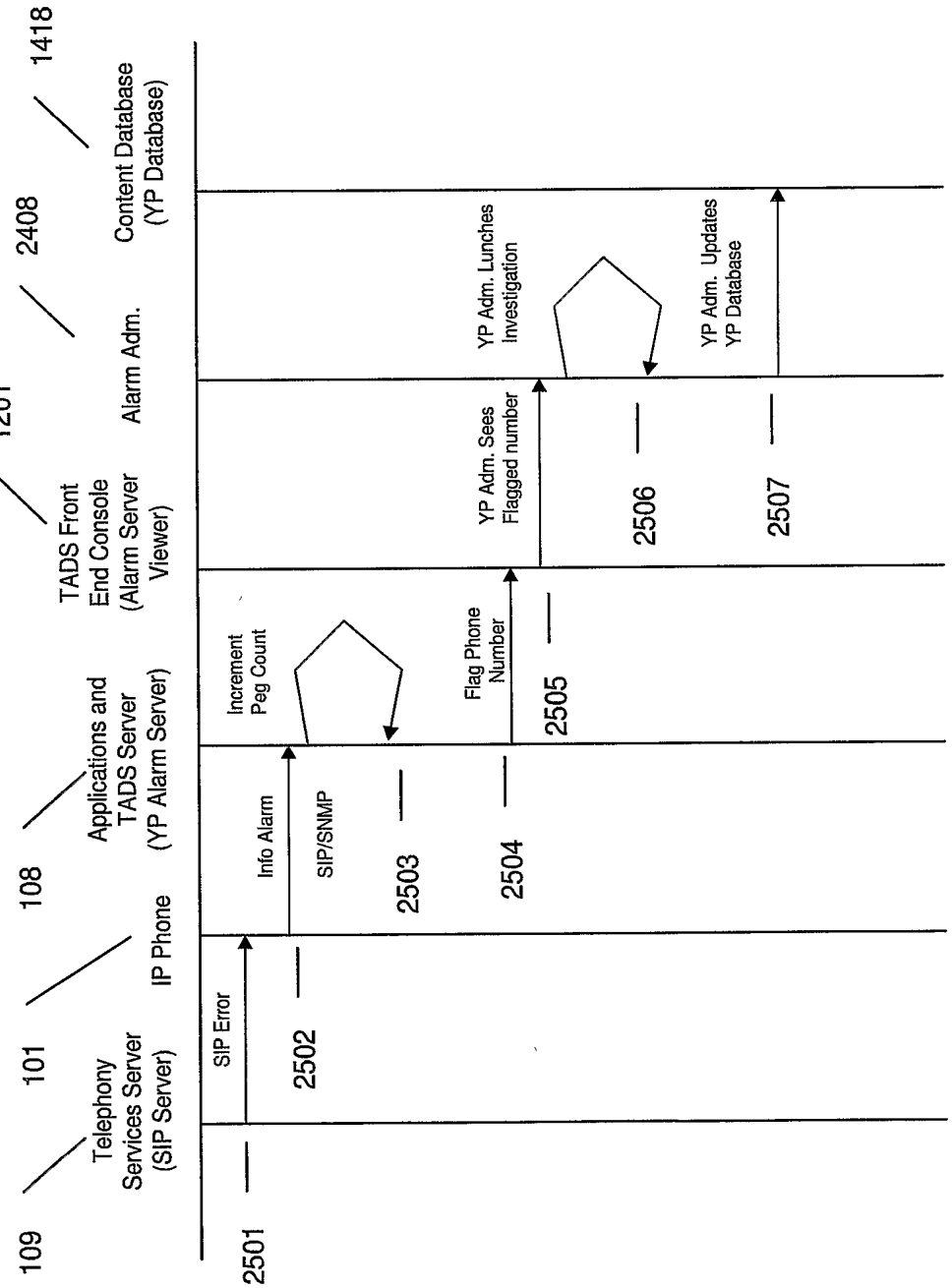

109
Telephony Services Server (SIP Server)
101
IP Phone
108
Applications and TADS Server (YP Alarm Server)
1201
TADS Front End Console (Alarm Server Viewer)
2408
Alarm Adm.
1418
Content Database (YP Database)
2501
SIP Error
2502
Info Alarm
SIP/SNMP
2503
Increment Peg Count
2504
Flag Phone Number
2505
YP Adm. Sees Flagged number
2506
YP Adm. Lunches Investigation
2507
YP Adm. Updates YP Database

Figure 26

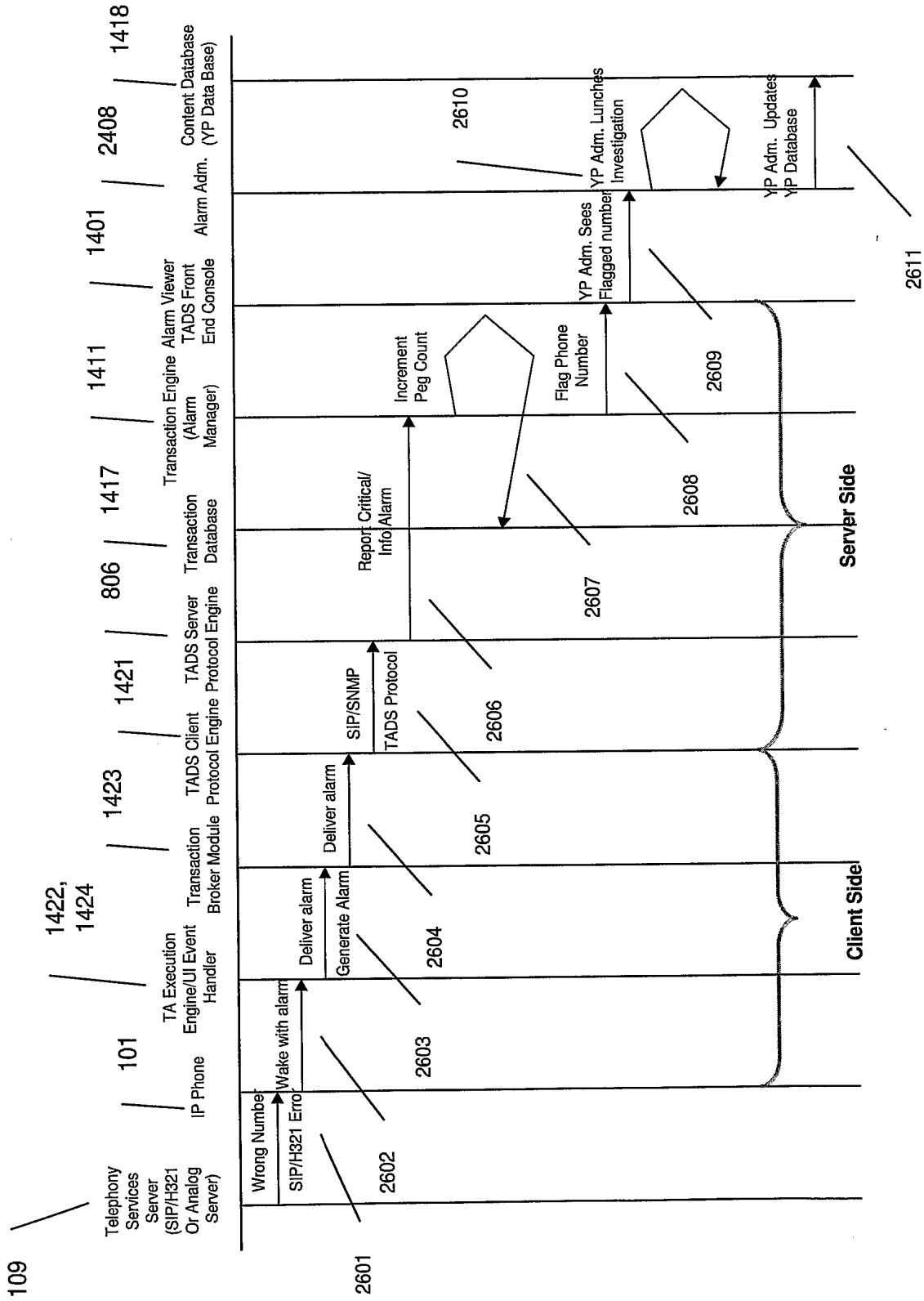

109
Telephony Services Server (SIP/H321 Or Analog Server)
101
IP Phone
1422, 1424
TA Execution Engine/UI Event Handler
1423
Transaction Broker Module
1421
TADS Client Protocol Engine
806
TADS Server Protocol Engine
1417
Transaction Database
1411
Transaction Engine (Alarm Manager)
1401
TADS Front End Console
Alarm Viewer
2408
Alarm Adm.
1418
Content Database (YP Data Base)
2601
2602
Wrong Numbe
SIP/H321 Erro
2603
Wake with alarm
Deliver alarm
2604
Generate Alarm
Deliver alarm
2605
SIP/SNMP
TADS Protocol
2606
Report Critical/ Info Alarm
2607
Increment Peg Count
2608
Flag Phone Number
2609
YP Adm. Sees Flagged number
2610
YP Adm. Lunches Investigation
YP Adm. Updates YP Database
2611
Client Side
Server Side

Figure 27

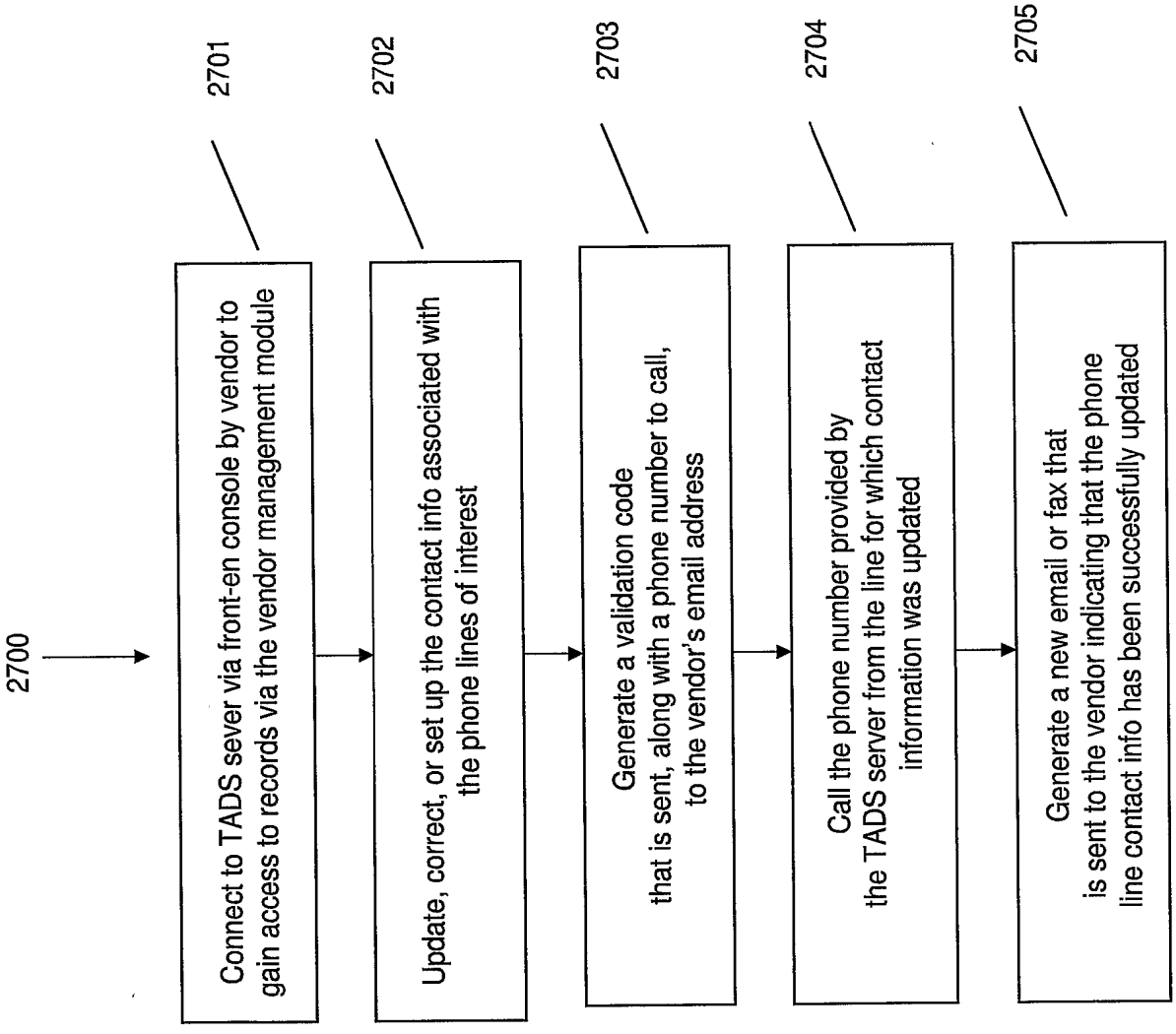

2700
2701
Connect to TADS sever via front-en console by vendor to gain access to records via the vendor management module
2702
Update, correct, or set up the contact info associated with the phone lines of interest
2703
Generate a validation code that is sent, along with a phone number to call, to the vendor's email address
2704
Call the phone number provided by the TADS server from the line for which contact information was updated
2705
Generate a new email or fax that is sent to the vendor indicating that the phone line contact info has been successfully updated

Figure 28

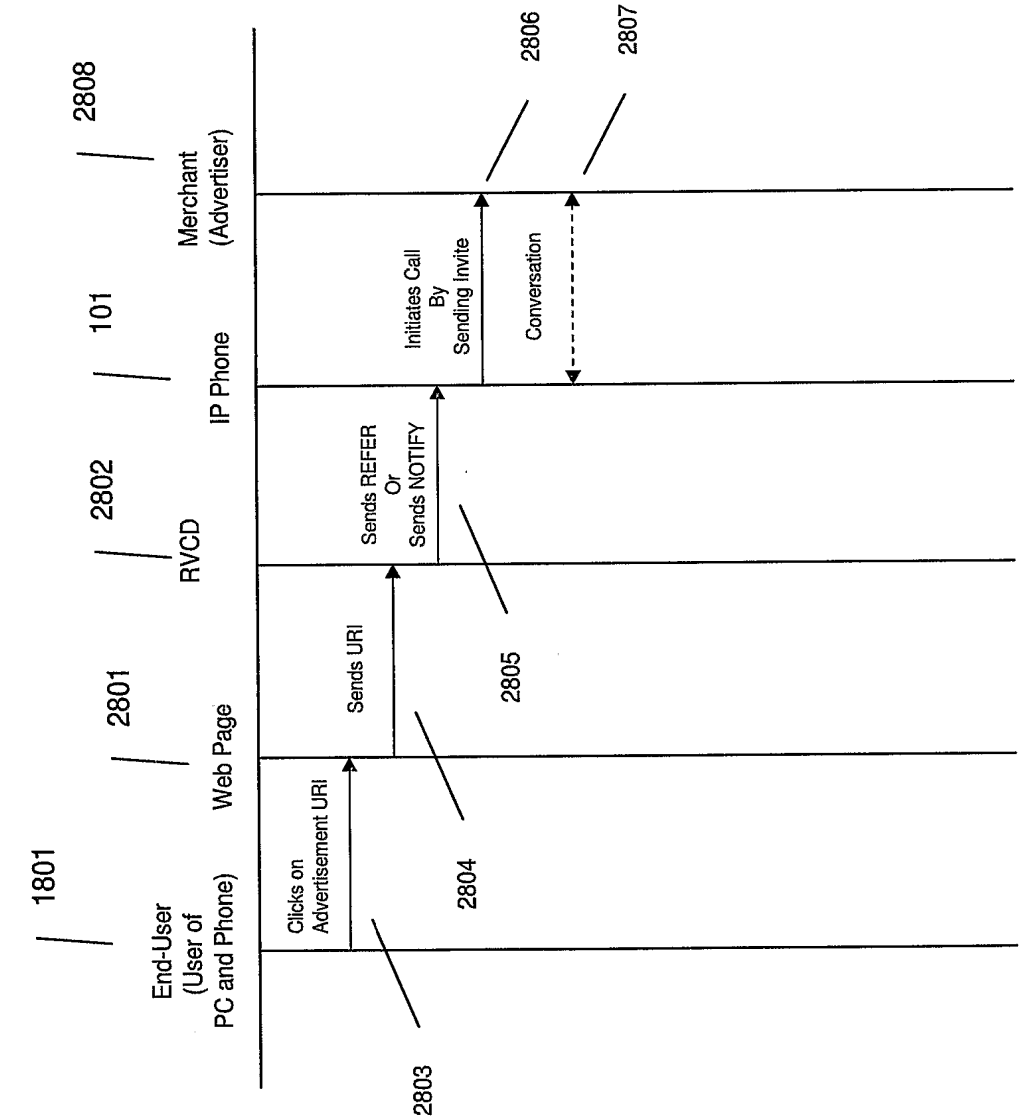

1801
End-User
(User of
PC and Phone)
2801
Web Page
2802
RVCD
101
IP Phone
2808
Merchant
(Advertiser)
Clicks on
Advertisement URI
Sends URI
Sends REFER
Or
Sends NOTIFY
Initiates Call
By
Sending Invite
Conversation
2803
2804
2805
2806
2807

Figure 29

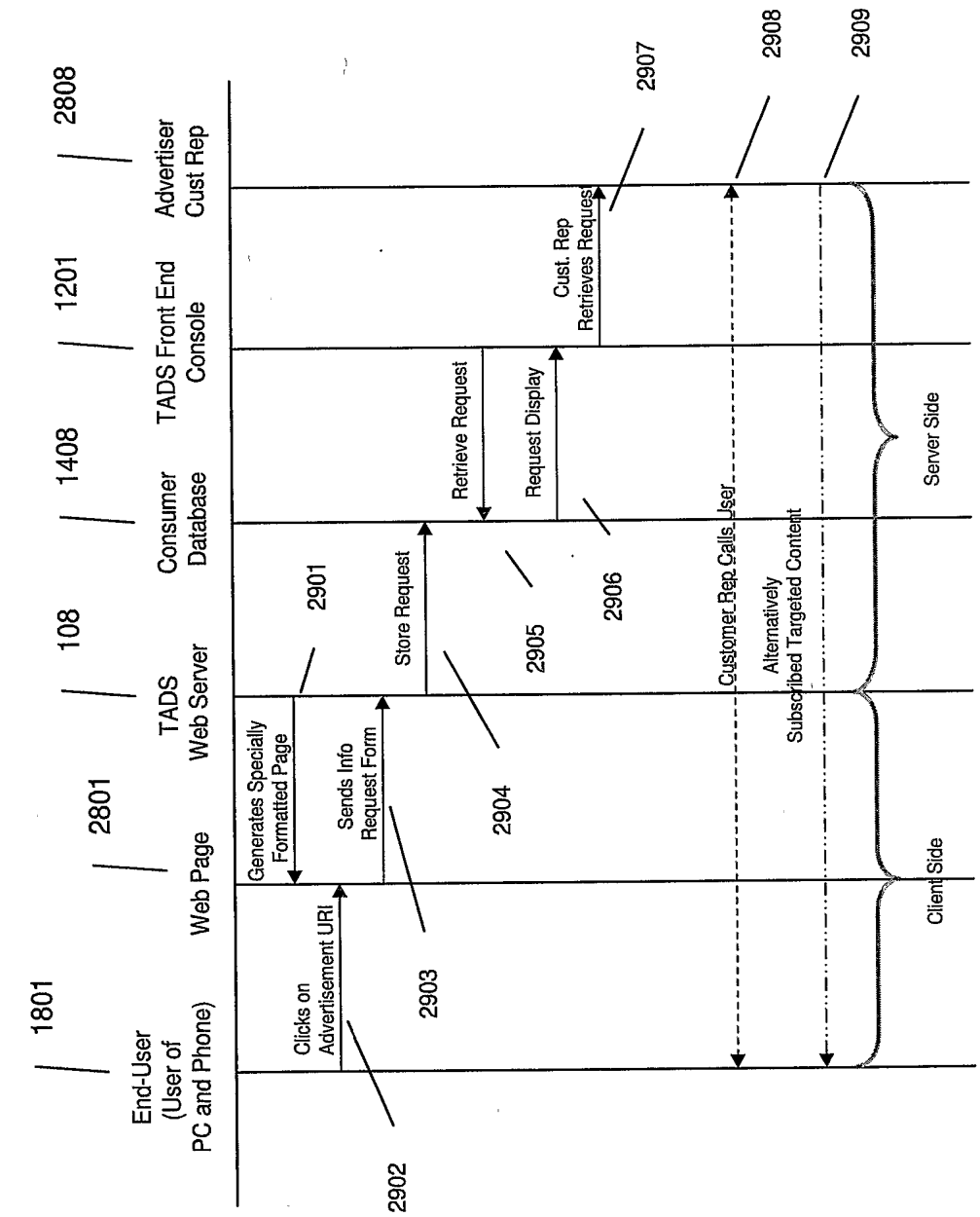

1801
End-User (User of PC and Phone)
2801
Web Page
108
TADS Web Server
1408
Consumer Database
1201
TADS Front End Console
2808
Advertiser Cust Rep
Clicks on Advertisement URI
Generates Specially Formatted Page
Sends Info Request Form
Store Request
Retrieve Request
Request Display
Cust. Rep Retrieves Reques
Customer Rep Calls User
Alternatively Subscribed Targeted Content
2902
2903
2904
2901
2905
2906
2907
2908
2909
Client Side
Server Side

Figure 30

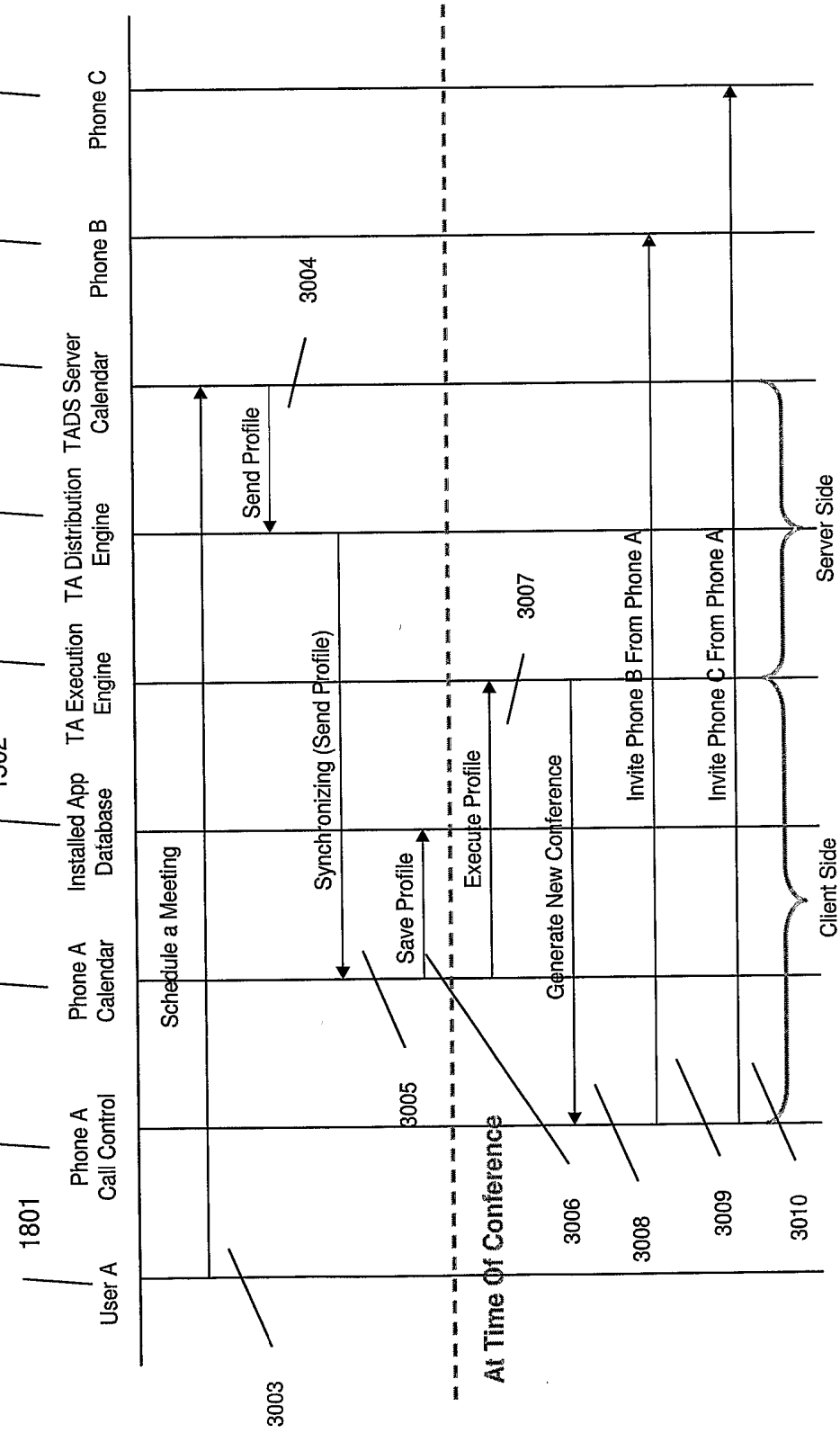

1801
User A
Phone A Call Control
3001
Phone A Calendar
3002
Installed App Database
1502
TA Execution Engine
1411
TA Distribution Engine
1413
TADS Server Calendar
108
Phone B
116
Phone C
117
3003
Schedule a Meeting
Synchronizing (Send Profile)
Send Profile
3004
Save Profile
3005
Execute Profile
3007
Generate New Conference
3006
Invite Phone B From Phone A
3008
Invite Phone C From Phone A
3009
3010
At Time Of Conference
Server Side
Client Side

Figure 31

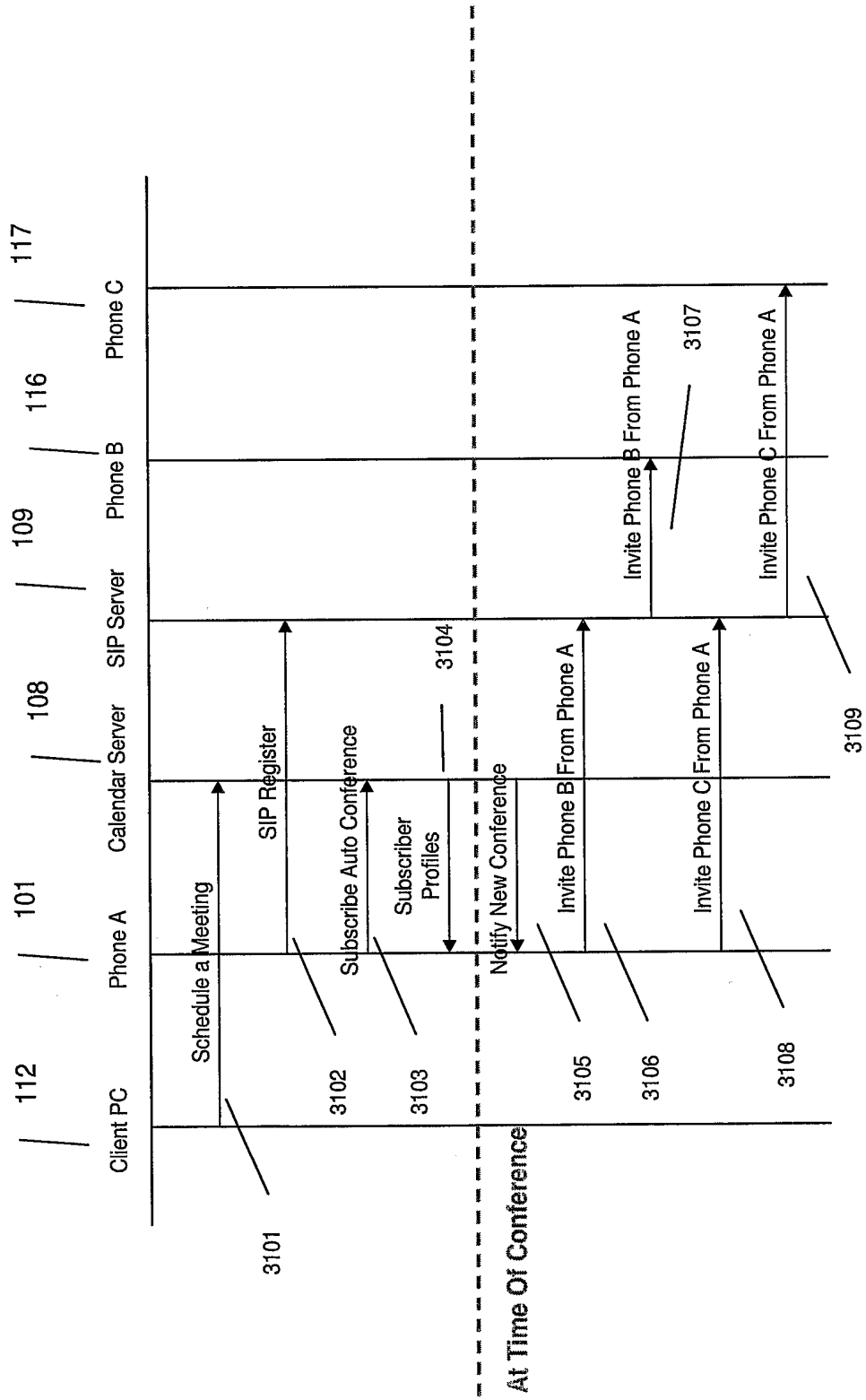

Client PC
112
Phone A
101
Calendar Server
108
SIP Server
109
Phone B
116
Phone C
117
Schedule a Meeting
3101
SIP Register
3102
Subscribe Auto Conference
3103
Subscriber Profiles
3104
Notify New Conference
At Time Of Conference
Invite Phone B From Phone A
3105
Invite Phone C From Phone A
3106
Invite Phone B From Phone A
3107
Invite Phone C From Phone A
3108
3109

Figure 32

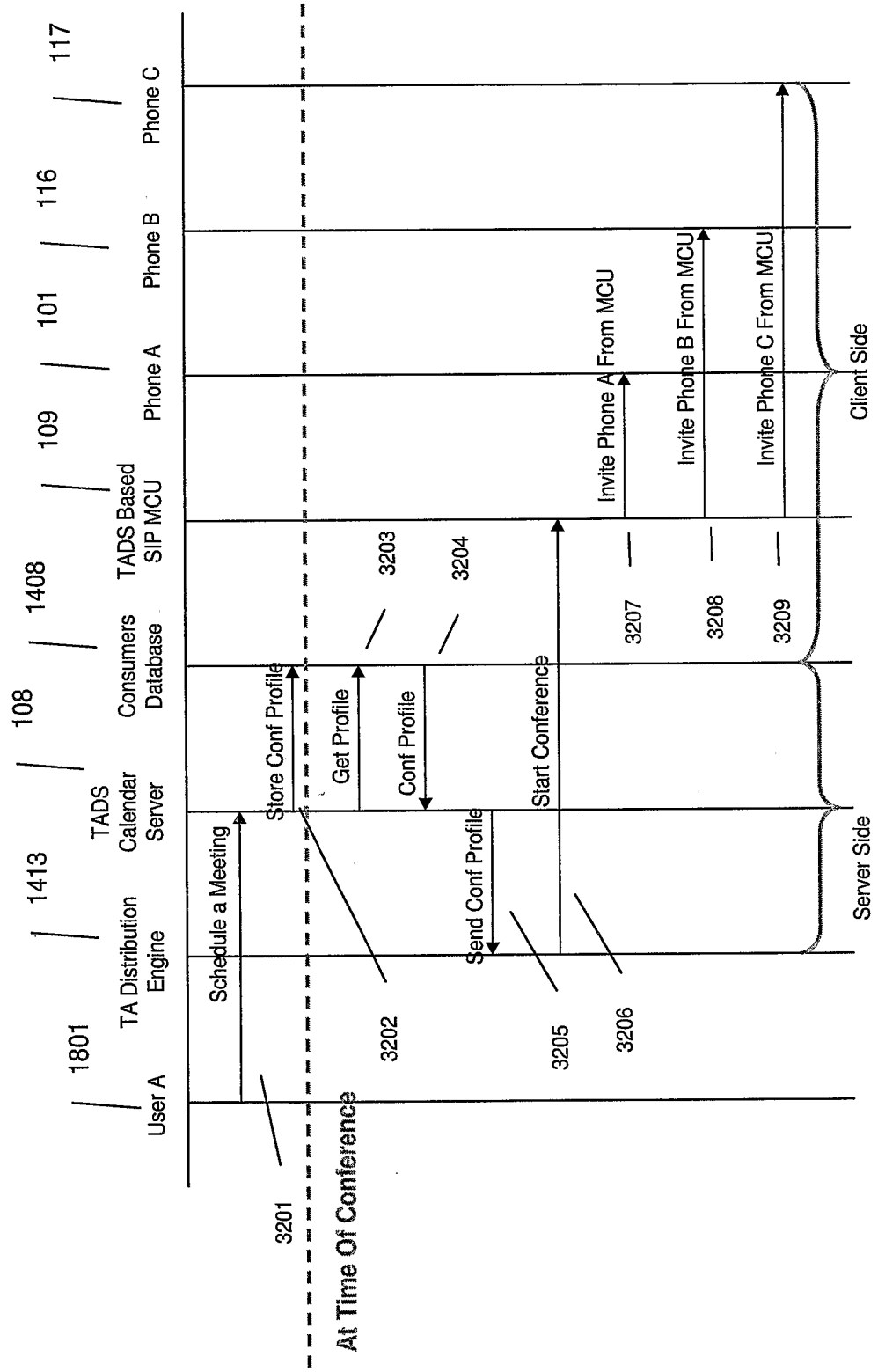

1801
User A
TA Distribution Engine
1413
TADS Calendar Server
108
Consumers Database
1408
TADS Based SIP MCU
109
Phone A
101
Phone B
116
Phone C
117
Schedule a Meeting
Store Conf Profile
Get Profile
Conf Profile
Send Conf Profile
Start Conference
Invite Phone A From MCU
Invite Phone B From MCU
Invite Phone C From MCU
3201
3202
3203
3204
3205
3206
3207
3208
3209
At Time Of Conference
Server Side
Client Side

Figure 33

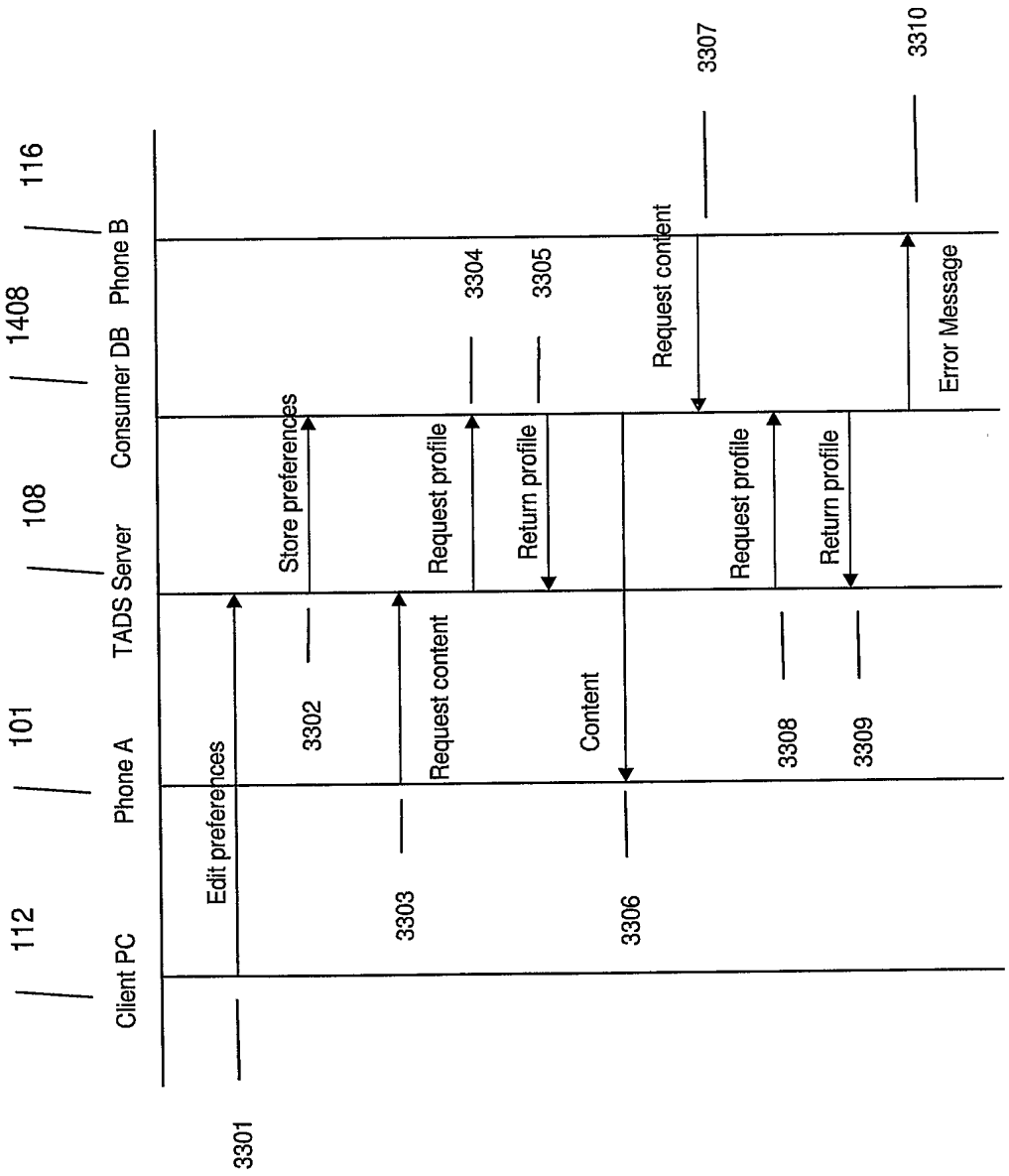

112
Client PC
101
Phone A
108
TADS Server
1408
Consumer DB
116
Phone B
3301
Edit preferences
3302
Store preferences
3303
Request content
3304
Request profile
3305
Return profile
3306
Content
3307
Request content
3308
Request profile
3309
Return profile
3310
Error Message

Figure 34

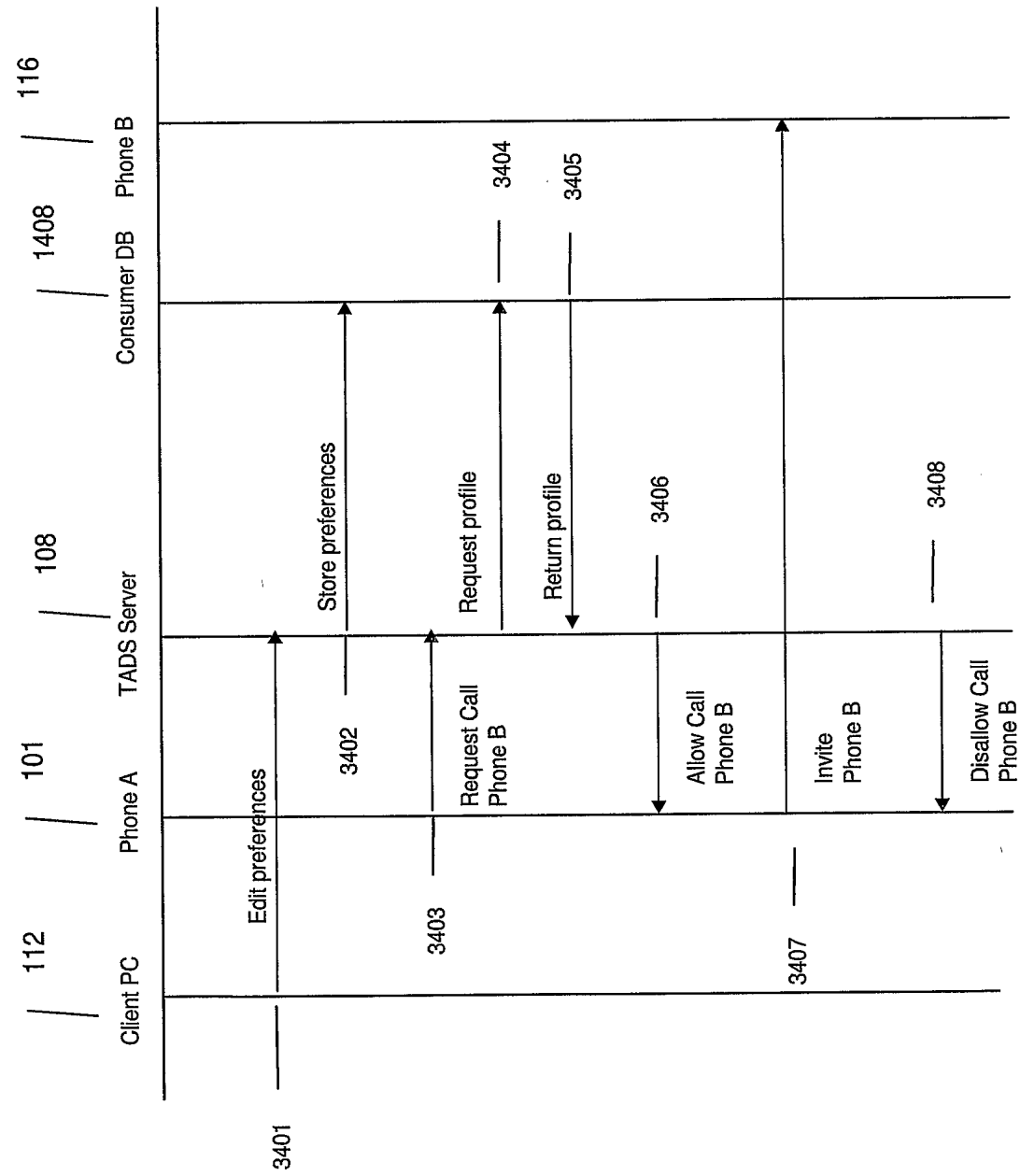

112
Client PC
101
Phone A
108
TADS Server
1408
Consumer DB
116
Phone B
Edit preferences
3401
Store preferences
3402
Request Call Phone B
3403
Request profile
3404
Return profile
3405
Allow Call Phone B
3406
Invite Phone B
3407
Disallow Call Phone B
3408

Figure 35

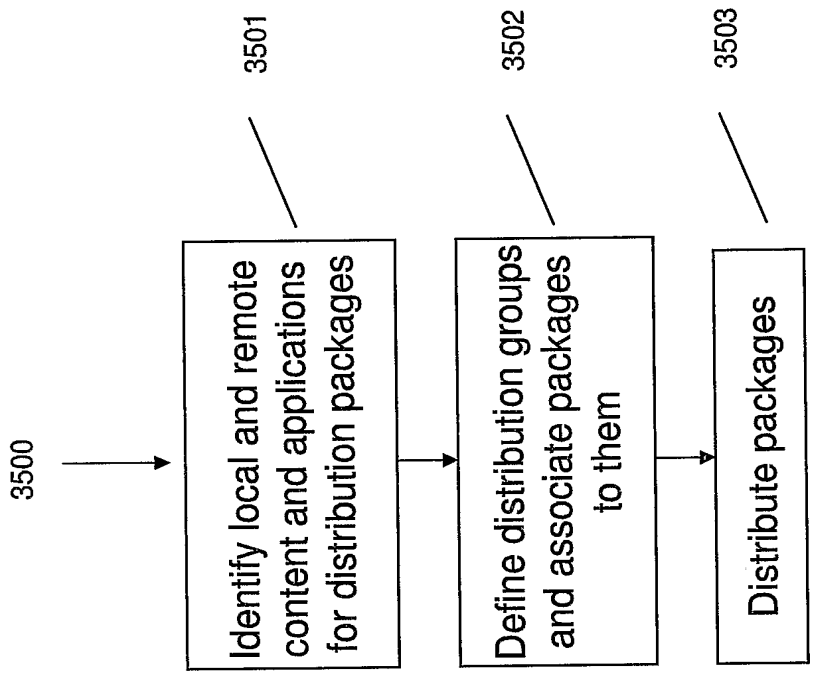

3500
Identify local and remote content and applications for distribution packages
3501
Define distribution groups and associate packages to them
3502
Distribute packages
3503

Figure 36

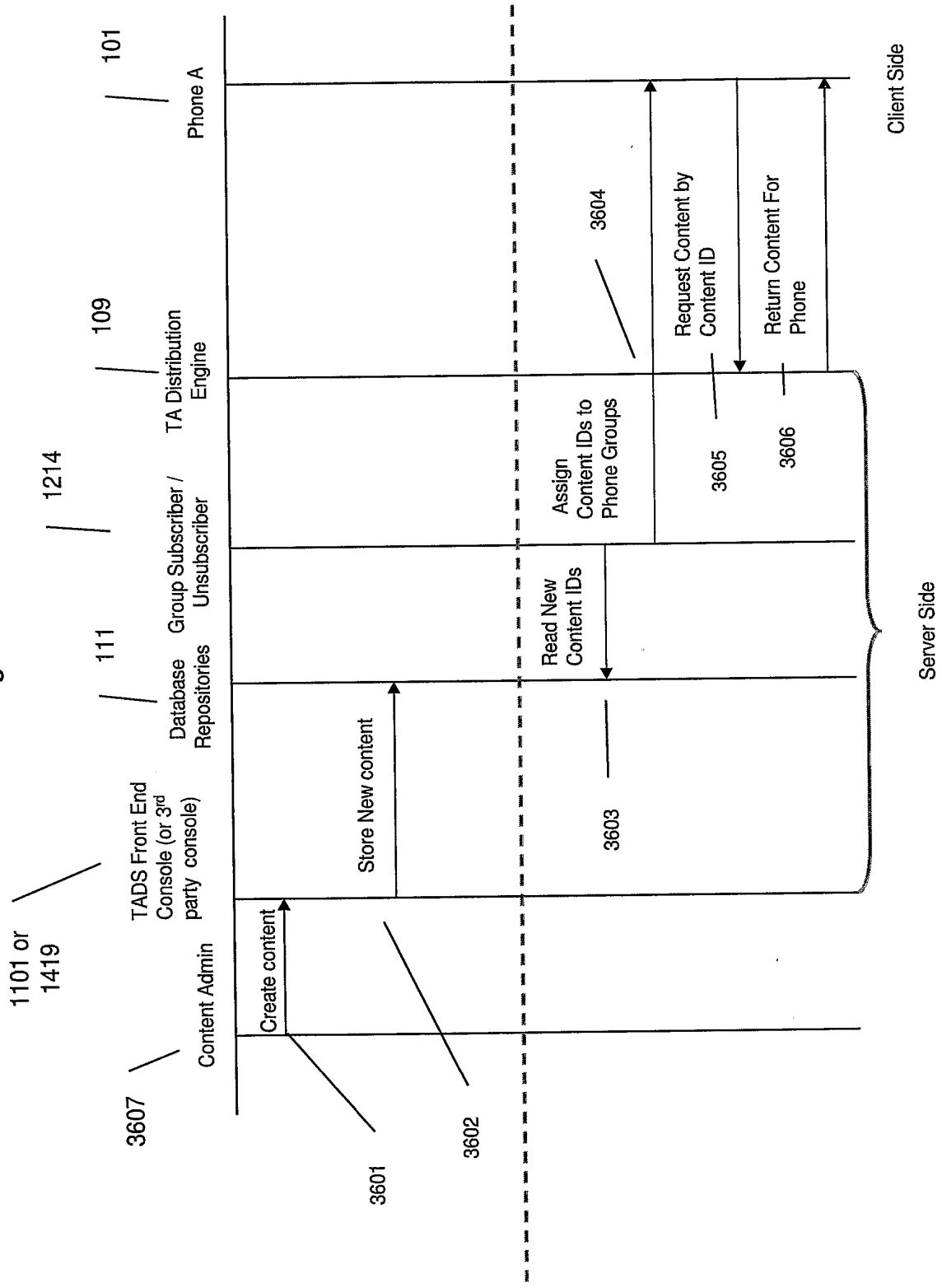

3607
Content Admin
1101 or 1419
TADS Front End Console (or 3rd party console)
111
Database Repositories
1214
Group Subscriber / Unsubscriber
109
TA Distribution Engine
101
Phone A
Client Side
Server Side
Create content
Store New content
Read New Content IDs
Assign Content IDs to Phone Groups
Request Content by Content ID
Return Content For Phone
3601
3602
3603
3604
3605
3606

Figure 37

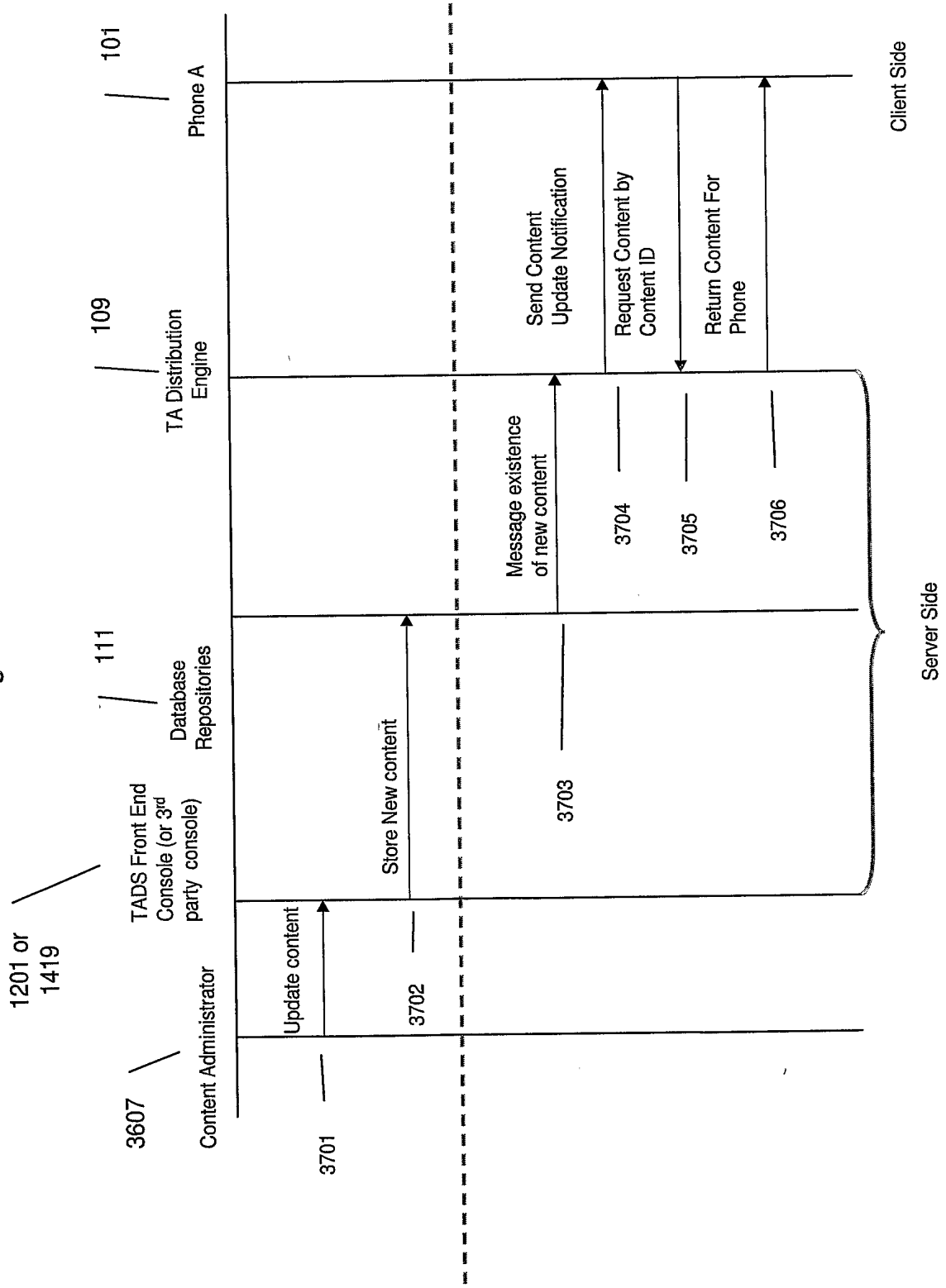

1201 or 1419
TADS Front End Console (or 3rd party console)
111
Database Repositories
109
TA Distribution Engine
101
Phone A
3607
Content Administrator
Update content
3701
Store New content
3702
Message existence of new content
3703
Send Content Update Notification
3704
Request Content by Content ID
3705
Return Content For Phone
3706
Server Side
Client Side

Figure 38

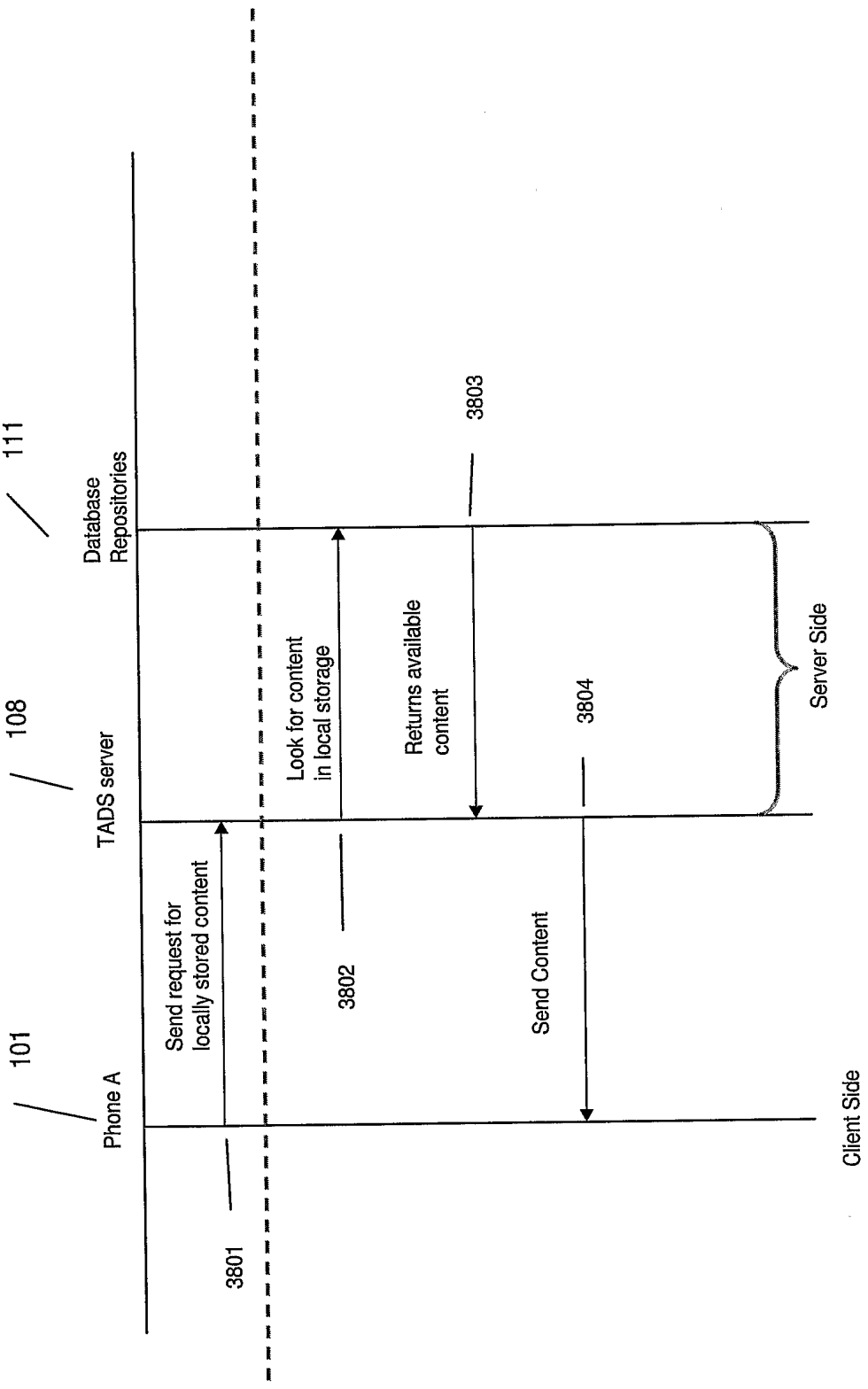

101
Phone A
108
TADS server
111
Database Repositories
Send request for locally stored content
Look for content in local storage
Returns available content
Send Content
3801
3802
3803
3804
Server Side
Client Side

Figure 39

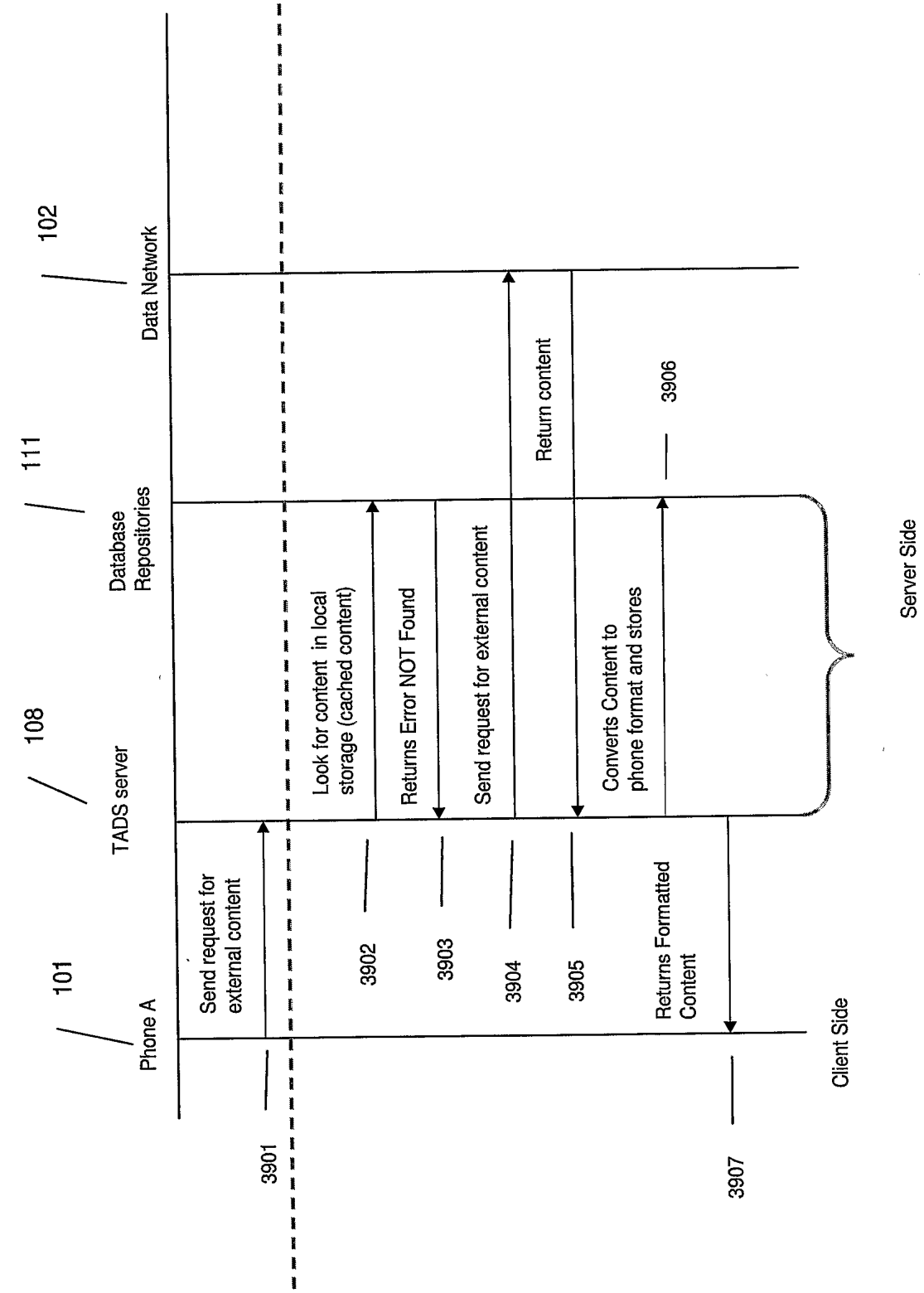

101
Phone A
108
TADS server
111
Database Repositories
102
Data Network
Send request for external content
Look for content in local storage (cached content)
Returns Error NOT Found
Send request for external content
Return content
Converts Content to phone format and stores
Returns Formatted Content
3901
3902
3903
3904
3905
3906
3907
Client Side
Server Side

Figure 40

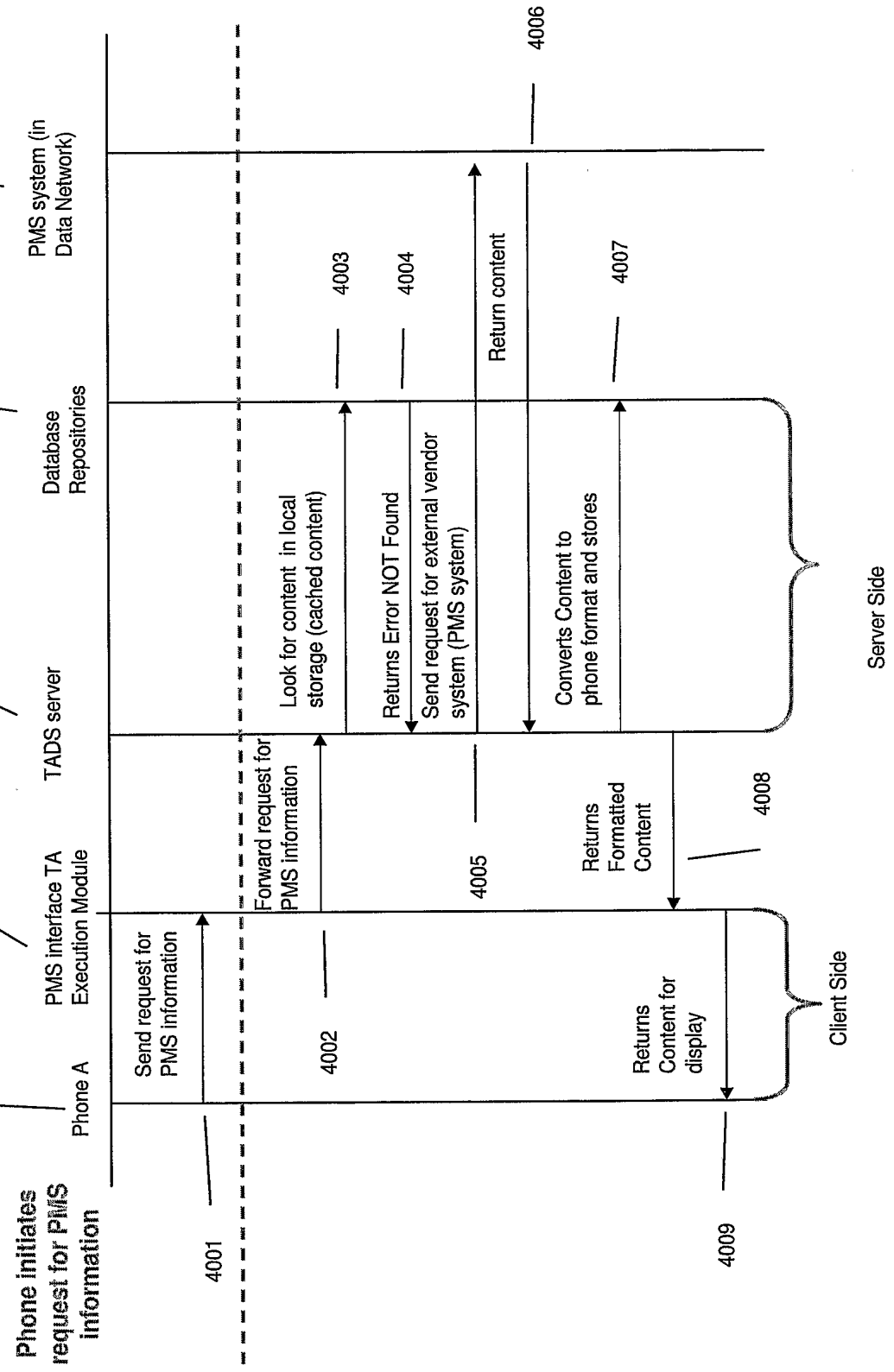

Phone initiates request for PMS information
101
Phone A
1503
PMS interface TA Execution Module
108
TADS server
111
Database Repositories
102
PMS system (in Data Network)
4001
Send request for PMS information
4002
Forward request for PMS information
Look for content in local storage (cached content)
4003
Returns Error NOT Found
4004
Send request for external vendor system (PMS system)
4005
Return content
4006
Converts Content to phone format and stores
4007
Returns Formatted Content
4008
Returns Content for display
4009
Client Side
Server Side

Figure 41

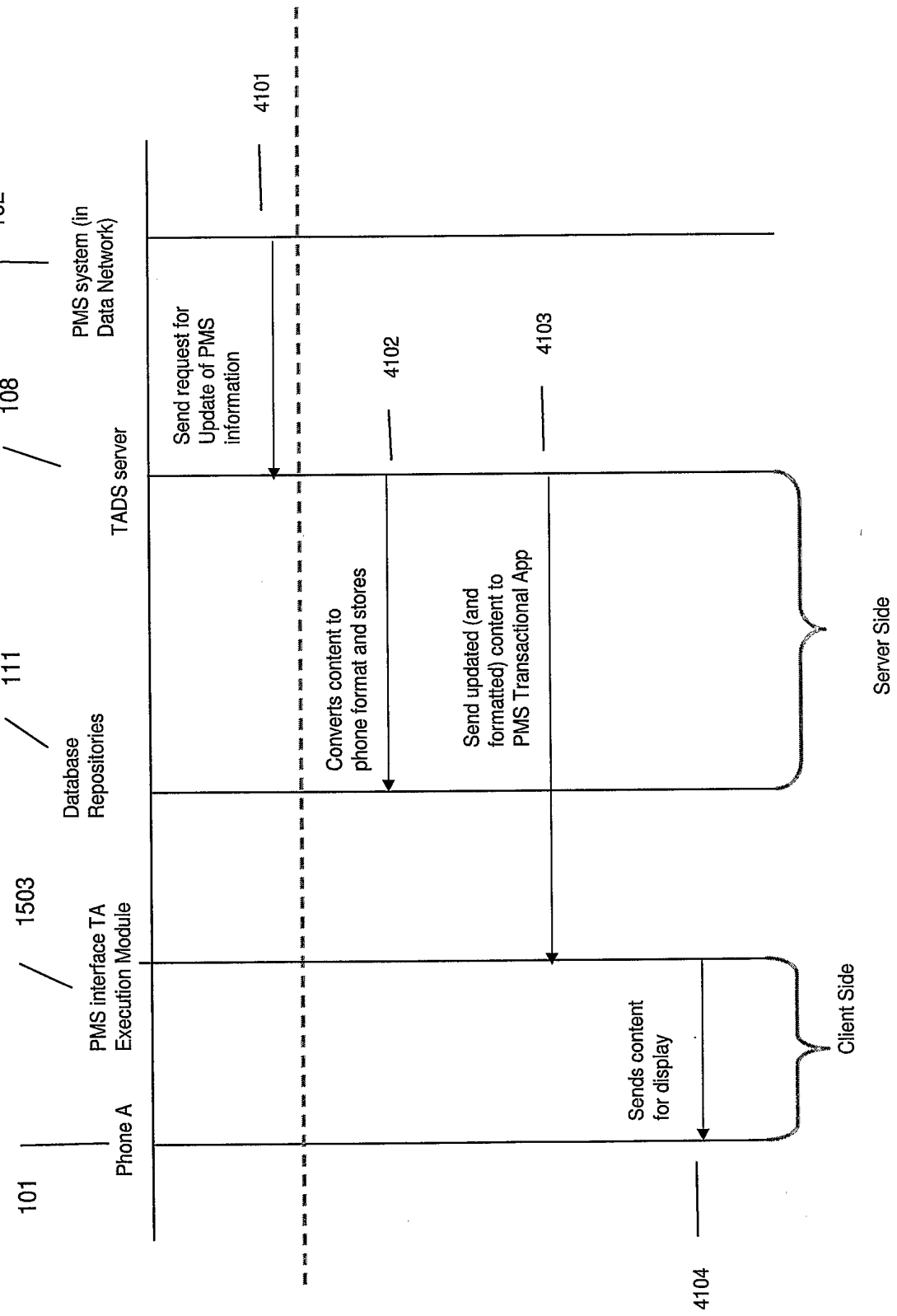

101
Phone A
1503
PMS interface TA Execution Module
111
Database Repositories
108
TADS server
102
PMS system (in Data Network)
4101
Send request for Update of PMS information
4102
Converts content to phone format and stores
4103
Send updated (and formatted) content to PMS Transactional App
4104
Sends content for display
Server Side
Client Side

Figure 42

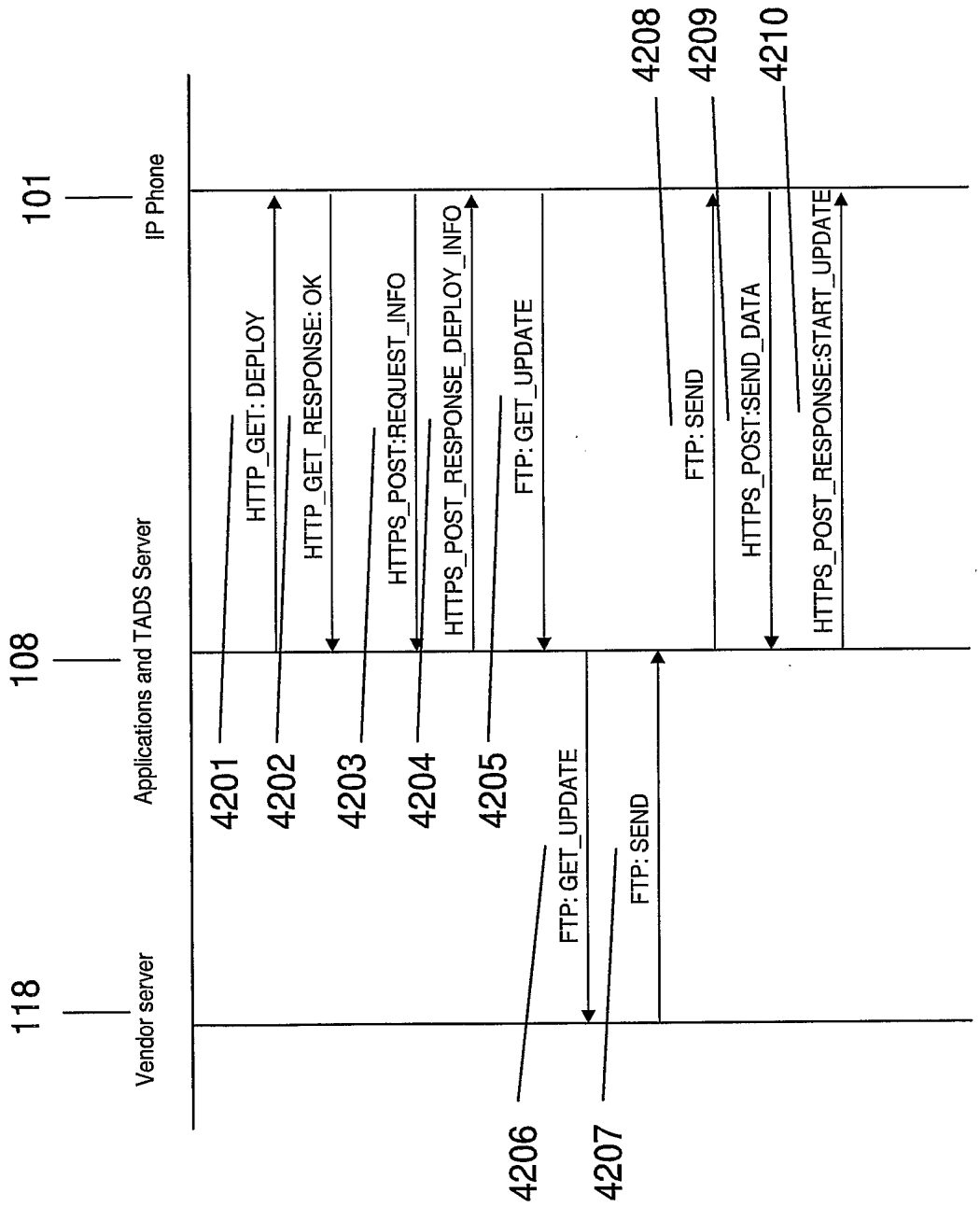
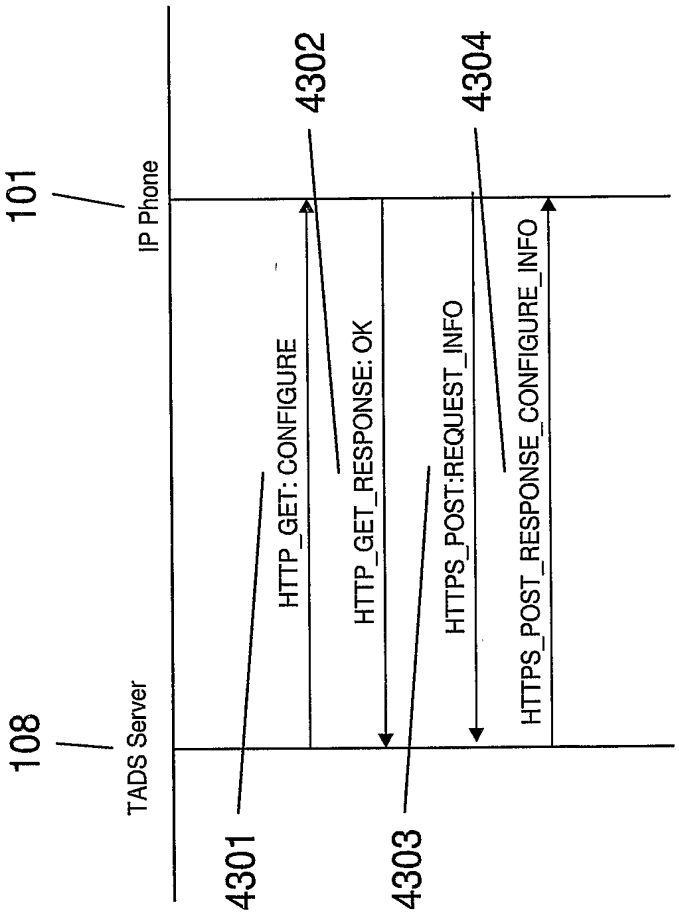

118
Vendor server
108
Applications and TADS Server
101
IP Phone
4201
HTTP_GET: DEPLOY
4202
HTTP_GET_RESPONSE: OK
4203
HTTPS_POST:REQUEST_INFO
4204
HTTPS_POST_RESPONSE_DEPLOY_INFO
4205
FTP: GET_UPDATE
4206
FTP: GET_UPDATE
4207
FTP: SEND
4208
FTP: SEND
4209
HTTPS_POST:SEND_DATA
4210
HTTPS_POST_RESPONSE:START_UPDATE

Figure 43


101
IP Phone
108
TADS Server
4301
HTTP_GET: CONFIGURE
4302
HTTP_GET_RESPONSE: OK
4303
HTTPS_POST:REQUEST_INFO
4304
HTTPS_POST_RESPONSE_CONFIGURE_INFO